

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—23RD YEAR.

SYDNEY, SATURDAY, DECEMBER 5, 1936.

No. 23.

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES—	Page.	LEADING ARTICLES—	Page.
The Placing of Long Radon Needles in the Treatment of Carcinoma of the Breast: A Preliminary Note, by J. L. GROVE and W. P. HOLMAN	771	The Metropolitan Hospitals Contribution Fund of New South Wales	791
Infections of the Upper Respiratory Tract in Children, by H. M. JAY, M.B., B.S.	774	CURRENT COMMENT—	
Infections of the Upper Respiratory Tract in Children, by R. L. THOROLD GRANT, M.B., B.S., M.R.C.P.	776	B ₁ Avitaminosis	792
Streptococcal Infections, by ARCHIE ASPINALL, M.B., Ch.M., F.R.A.C.S.	778	Bromide Intoxication	793
Robert Boyle and his Influence on Scientific Medicine, by A. R. SOUTHWOOD, M.D., M.S., M.R.C.P.	780	The Effect of Solar Radiation on Animals	795
The Result of the Routine Use of the Wassermann Test in 3,404 Patients Attending for Ante-Natal Care, by T. DIXON HUGHES, M.B., Ch.M., F.R.A.C.S., M.C.O.G., and CHARLOTTE GAMMIE, M.B., B.S.	783	ABSTRACTS FROM CURRENT MEDICAL LITERATURE—	
Local Anaesthesia in Abdominal Surgery, by V. J. KINSELLA	785	Medicine	796
REPORTS OF CASES—		BRITISH MEDICAL ASSOCIATION NEWS—	
Acute Idiopathic Aplastic Anaemia, by ALEX. MURPHY, M.C., M.B., Ch.M.	788	Scientific	798
Sudden Death Due to Air Embolism, by IAN HAMILTON, M.B., B.S., F.R.C.S., F.R.A.C.S.	789	CORRESPONDENCE—	
REVIEWS—		Medical Education	803
The Adrenals	789	The Library of the School of Public Health and Tropical Medicine, Sydney	803
Heart and Arterial Disease	790	OBITUARY—	
Gynaecological and Obstetrical Tuberculosis	790	George James Hodgson	804
		CORRIGENDUM	804
		BOOKS RECEIVED	804
		DIARY FOR THE MONTH	804
		MEDICAL APPOINTMENTS VACANT, ETC.	804
		MEDICAL APPOINTMENTS: IMPORTANT NOTICE	804
		EDITORIAL NOTICES	804

THE PLACING OF LONG RADON NEEDLES IN THE TREATMENT OF CARCINOMA OF THE BREAST: A PRELIMINARY NOTE.¹

By J. L. GROVE,
Medical Superintendent, Launceston Hospital,

AND

W. P. HOLMAN,
Radiologist, Launceston Hospital.

(From the Consultative Clinic at the Launceston Public Hospital.)

At a meeting of the Northern Division of the Tasmanian Branch of the British Medical Association held on July 7, 1934, a symposium was read on carcinoma of the breast. In connexion with this, a

¹ Read at the seventh Australian Cancer Conference, Melbourne, May, 1936.

follow-up was carried out of all cases treated by the clinic since supplies of radium were made available by the Commonwealth Government. The method of treatment up to that time had been radical mastectomy, supplemented by the insertion of radium element needles into certain areas before closure of the incision. The results disclosed were found to be so disappointing that the clinic felt bound to consider alternative methods. One of us (W.P.H.) had been in touch with the work of Kaye Scott at the Royal Melbourne Hospital. Using long, heavily filtered radon needles, he designed his plan to irradiate sufficiently not only the tumour, but the whole of the tissues which would be removed by the radical operation. After considerable discussion it was decided that "operable" cases be treated by surgery combined with deep therapy, and all others by interstitially placed radon needles, which, through the generosity of the Commonwealth

Department of Health and the cooperation of its laboratory in Melbourne, have been made available to the hospital since 1933.

At this stage we realized that our standard of operability had been too broad, and since then we have regarded cases as operable only when the tumour appeared to be restricted to breast tissue itself. A preliminary radiograph of the chest and of the lumbar spine should always be included in the investigation.

Unfortunately up to the present no deep therapy has been available in Tasmania, and of the patients with operable tumours, so far only two have been able to bear the expense of visits to the mainland. The actual treatment in our radon cases has been carried out by two of us working together with a surgeon (Dr. C. Craig) in what may be described as an actively critical cooperation.

We were encouraged to commence the radon treatment of carcinoma of the breast, as we have stated, by the good results obtained by Kaye Scott and the fact that his work in cooperation with the Commonwealth Radium Laboratory had resulted in needles being available which were: (i) of any prescribed length up to 10 centimetres, (ii) of sufficiently heavy filtration (0.8 millimetre of platinum equivalent), (iii) flexible and blunt, (iv) of such linear strength that little or no alteration in the technical factors used with unit strength radium needles was necessary.

Unfortunately we were unable to see Kaye Scott at work and based our initial attempt at irradiation on descriptions of his method. It was seen at once that the plan of our first treatment was unsatisfactory, both in the placing of the individual needles and also because of the under-estimation of the amount of radon required to treat the tissues outside the breast. We have since developed a technique, of which a typical example is seen in the experiment to be described.

The primary results in the very small number of cases already treated have been so encouraging that we have decided to continue the use of this method.

This paper is a preliminary note on an investigation we are carrying out to try to determine: (i) Whether satisfactory irradiation reaches all the tissues which would be removed by radical mastectomy. (ii) Conversely, how far beyond the scope of the operation certain key areas are irradiated. (iii) Whether the planned distribution of the needles is actually achieved in fact.

It was decided to carry out a symbolic irradiation of the breast and regional lymph fields of a female cadaver and to follow this up by a dissection to represent a radical mastectomy, after which an attempt was to be made to arrive at an answer to the problems set.

Certain preliminary work was necessary to make this possible. A material had to be found which was radio-opaque and which at the same time would present no serious obstacle to the dissecting scalpel.

After experiments it was found that wooden swab sticks could be impregnated with sodium iodide

until they became opaque to X rays. Further, they were found to be rigid enough to be implanted accurately in the cadaver, and could be easily cut when encountered during a dissection.

It was considered that from past experience we could make a fair estimate of the volume of the tissues which is sufficiently irradiated by our standard needles in a standard time. Nevertheless, when dealing with a block of some magnitude in three dimensions it was felt to be desirable to have some means of graphical representation of the approximate useful fields around the long needles used.

In connexion with this we have made use of the work published by the Memorial Hospital Staff since 1926 and have commenced certain experiments with the needles at our disposal on the bleaching of butter and cheese and the blackening of photographic films. (1) (2) (3) (4) (5) (6)

Wooden models have been constructed to represent the useful field around the typical needles. No claim is made as to the accuracy of the dimensions of these blocks. They merely serve to reduce the subjective error in our estimation of the effect of any given needle. It is our intention to carry this part of the experiment to a greater degree of accuracy.

At this stage in our work we have already felt the need for constant cooperation with a physicist. We have reason to expect that the Launceston Public Hospital Board will be able to make such an appointment in the near future.

The steps of the experiment were:

A. An area representing an underlying tumour was marked out on the skin of the breast of a female cadaver.

B. Measurements were made as would be done in specifying the radon needles required from the laboratory. These consist in actually measuring the size of the breast, the width and length of the chest wall to be dealt with, the size of the axillary walls and the lower part of the posterior triangle of the neck.

C. The wooden needles were then implanted in the breast and surrounding areas in the same way that we have used them in actual clinical cases.

In general these needles are placed not more than two centimetres apart, and when two layers are used these layers are also not more than two centimetres apart.

1. The whole breast was irradiated by two groups of needles: (a) a deep horizontal layer of six needles (each ten centimetres long), (b) a superficial vertical layer of six needles (each ten centimetres long).

2. One needle (ten centimetres long) was buried just caudal to the breast across the deep fascia over the *rectus abdominis*.

3. One needle (ten centimetres long) ran vertically just lateral to the breast, approximately along the line of the thoracic vessels.

4. In the upper and outer pectoral area: (a) four needles (each eight centimetres long) were deeply placed under the *pectoralis major* muscle; (b) four needles (each eight centimetres long) were placed parallel with the above superficially.

5. In the infraclavicular region one needle (eight centimetres long) and one needle (four centimetres long) were placed.

6. In the supraclavicular region two needles (each eight centimetres long) and one needle (six centimetres long) were placed.

7. In the lateral axillary wall two needles (each eight centimetres long) were placed.

8. In the posterior axillary wall three needles (each eight centimetres long) were placed.

9. In the high medial axillary wall (between 4 (a) and 8) two needles (each eight centimetres long) were placed.

D. At this stage photographs were taken to show the arrangement of the skin punctures (see Figures I, II, III) and a radiograph to show the "needles" *in situ*.



FIGURE I.

E. A dissection was then done by a surgeon (Dr. T. G. H. Hogg), representing a radical surgical removal of the breast. When the scalpel encountered wooden needles these were cut through and the fragments were left *in situ*.

F. A further radiograph was taken at this stage.

G. The block of tissues removed was dissected to determine the position of the "needles".

H. A rough estimation of the area sufficiently irradiated was then made, the wooden blocks being used as a guide both in the tissues removed and the area remaining.

As a result of this first experiment we have come to the following conclusions:

1. That it is possible to irradiate satisfactorily all the tissues which would be removed in the radical operation.

2. That it is possible to irradiate satisfactorily certain important fields which are beyond the scope of operation: (a) the supraclavicular area, (b) the subclavicular area, (c) the area medial to the extreme apex of the axilla, (d) the lateral wall of the axilla, (e) the deep fascia (the area irradiated is wider and deeper than the area dissected). It is necessary to remember that the deep layer of needles hugs the bony thorax.



FIGURE II.

3. That with long needles it is possible to achieve with reasonable accuracy a planned distribution.

In conclusion, our feeling is that further investigation along these lines is essential and is likely to strengthen our faith in a method of treatment which has given encouraging preliminary results.



FIGURE III.

No apology is made for presenting a preliminary note on an uncompleted series of experiments. Our main object is to show how active cooperation on an equal footing between physician, surgeon and radiologist may further the treatment of cancer.

References.

- ⁽¹⁾ G. Falla: "The Development of Filtered Radon Implants", *American Journal of Roentgenology and Radium Therapy*, Volume XVI, 1926, page 507.
- ⁽²⁾ E. H. Quimby and H. E. Martin: "A Basis for Dosage Determination in Interstitial Irradiation", *American Journal of Roentgenology and Radium Therapy*, Volume XXI, 1926, page 248.
- ⁽³⁾ H. E. Martin and E. H. Quimby: "Calculations of Tissue Dosage in Radiation Therapy: Preliminary Report", *American Journal of Roentgenology and Radium Therapy*, Volume XXIII, 1930, page 173.
- ⁽⁴⁾ H. E. Martin, E. H. Quimby and G. T. Pack: "Calculations of Tissue Dosage in Radiation Therapy", *American Journal of Roentgenology and Radium Therapy*, Volume XXV, 1931, page 490.
- ⁽⁵⁾ E. H. Quimby: "Determination of Dosage for Long Radium or Radon Needles", *American Journal of Roentgenology and Radium Therapy*, Volume LI, 1934, page 74.
- ⁽⁶⁾ E. H. Quimby: "Physical Factors in Interstitial Radium Therapy", *American Journal of Roentgenology and Radium Therapy*, Volume XXXIII, 1935, page 306.

INFECTIONS OF THE UPPER RESPIRATORY TRACT IN CHILDREN.¹

By H. M. JAY, M.B., B.S. (Adelaide),
Honorary Aural Surgeon, Adelaide Hospital,
Adelaide.

I HAVE been asked to say something tonight on upper respiratory infections in children; so I cannot complain that the subject is not wide enough in its possibilities to give anyone ample scope for discussion.

It always seems to me that we must regard these infections as being more potentially serious in children than in adults. It is true that in both types of patients the same symptoms and complications may present themselves, and (with minor exceptions) both are liable to the same severe acute extensions or accidents peculiar to the infection. In children, however, because of their inability to aid in diagnosis by a description of their sensations, the danger is much greater of an acute infection drifting into that chronic stage which so often lays the foundation for a lifelong disability or even results in a shortening of life.

Since I sat down to think about what I should say to you I have asked myself quite a lot of questions to which I am unable to supply any answer, and of these, two of the most important and the most fascinating to speculate upon are: "Why do some children pick up so many more infections than others, and, when they have picked up the infections, why do they take so long to throw them off?" One can supply some sort of an answer to these questions, but when that answer is supplied it does not seem to me that we are much further advanced. Supposing I said to you: "Of course we know that the child whose pharynx and naso-pharynx are filled with lymphoid tissue is always catching colds." You agree; but that does not help us, because if you remove that child's tonsils and adenoids, what does he do? Promptly grows more in some other part of Waldeyer's ring; and you are back where

you started. These children seem to demand lymphoid tissue and, when they have got it, it does nothing but make a nuisance of itself. What is the reason for this? Is it an hereditary tendency? Is it due to dietary deficiencies? Is it a matter upon which the endocrinologist can enlighten us? I do not know, but I hope to be told. One thing I am presumptuous enough to say, and that is that I am convinced that a great deal can be done by a strict attention to diet along certain lines. This is one of those things in medicine that is almost impossible of proof in the human subject. One just gets impressions—a notoriously unreliable method of building a foundation for scientific fact. I do know, though, that I have had results by following out these ideas that I did not get before I tried them. More of this later. Another thing that predisposes children to colds is defective nasal breathing. Now I should like to point out to you something that is not generally recognized nearly so much as it should be, namely, the influence of malocclusion in the production of the mouth-breathing habit. Babies who suck their fingers and thumbs always seem to me to be more likely to develop this trouble than those who have dummies—presumably because the habit lasts longer, the fingers being always available, whereas the dummy is not.

Malformation of the upper jaw leads to retraction of the upper lip, and the unfortunate child cannot keep its mouth shut except by an effort. Removal of tonsils and adenoids does no good once this deformity has developed, though admittedly the operation frequently has to be performed before the orthodontist takes the case in hand if he is to have a fair chance of achieving success.

Now let us talk of stuffy noses and sinusitis. By stuffy noses I do not necessarily mean noses filled with mucus, but noses with turbinate swelling which keeps the airway constantly blocked and transforms the little patient into a mouth-breather, thereby increasing his liability to infections of the upper respiratory tract. Why do these turbinates swell? Well, I think I can answer that a little better than some of the other questions. First, one frequently (but not invariably) sees it in association with the so-called and above-mentioned lymphatic diathesis; secondly, it is commonly associated with a catarrhal infection of the sinuses; and, thirdly, it is seen in allergic states. Now, of course, I am mounting my hobby-horse, as some of you well know; but I will try not to ride it for too long, as so much else remains to be said.

When a child is brought to me showing this turbinate swelling, particularly if it happens to be associated with pallor of the mucosa, I always make inquiries regarding sneezing attacks, urticaria, hay fever or asthma in relatives. In the presence of a confirmatory history much may be done by desensitization or zinc ionization.

Of course these children, from the very nature of the affection from which they suffer, are rendered more

¹Read at a meeting of the South Australian Branch of the British Medical Association on September 26, 1936.

susceptible to infections than non-allergic types, so that it is not surprising that one sees a number in whom the case is complicated by a sinusitis. To my mind this is the most disastrous happening that can befall a child's upper air passages—infected sinuses in an allergic subject. These are the patients who provide us with so much morbidity in the "chronic bronchitis-asthma" group. The worst of it is that, though the sinusitis may be recognized and surgically treated, the allergic factor generally goes unrecognized; polypi form (or reform, as the case may be) and infection takes a fresh lease of life in the fertile soil provided. A vicious circle is set up. Treatment in these cases is heart-breaking for all concerned, but the allergic factor must be recognized if cure is to be effected.

Speaking of sinuses, it may be well to remind you that the majority of sinus infections in children are confined to the antra and ethmoids—occasionally the sphenoid. The frontal sinus does not develop to any size as a rule until the age of seven to nine years, and rarely gives trouble before the age of fifteen—and a very good thing too; we have enough on our hands with the antra without having a frontal sinus as well.

Perhaps some of you are wondering when I am going to mention bronchiectasis in connexion with sinusitis. Well, I very nearly did not mention it at all, because so much has been written and said about it that there seems little need for me to stress it. Also I think it is Dr. Grant's domain rather than mine. I may, however, mention that no medical man who is called upon to treat a patient with a chronic or recurring bronchitis can be said to have carried out his duty to that patient unless his examination has included the upper air passages and he has satisfied himself that sinusitis is not present.

There is one other point to which I wish to draw your attention—one which, I venture to say, will probably be new to many of you. I refer to the association of pneumonia with sinusitis. It has been my experience that patients with a history of two or more attacks of pneumonia almost invariably have a well-established sinus infection. I do not think I should be overstepping the mark if I said to you: "Have the sinuses examined in all your pneumonia cases." Unfortunately for the general practitioner, transillumination as an aid to diagnosis in children is even less to be relied upon than it is in adults, so that an examination of the nose and posterior pharyngeal wall for pus or mucus must be regarded as his diagnostic sheet anchor. An X ray photograph will generally furnish confirmatory evidence.

Speaking of sinusitis, there are one or two other things I should like to say that I hope will interest you, even if you do not agree with them.

In the first place, I am convinced that too much stress has been laid on the presence of enlarged tonsils and adenoids as a factor in the production of middle ear suppuration. Do not misunderstand

me: I am not suggesting that they are not responsible for many running ears—they are! What I mean is that attention has been so focused on them that the (to my mind) more important probability of a sinus infection being present is apt to be overlooked. This is brought home to me every summer in the wards of the Adelaide Hospital, where I frequently have as many as three or four patients at the same time with the same history and the same symptoms. They will all be boys or young men who have been swimming; they will all have a running ear (or ears); and they will all have pus in their nasal cavities. This becomes such a regular thing in the summer months that it would be a joke if it were not for its serious side. One looks in the ear, one looks in the nose, and then: "Where have you been swimming, in the Torrens or the sea?" I am stressing this because I want to make the point that removal of tonsils and adenoids in a child with a running ear is not the last word in treatment. Before you do this you must make sure that your little patient has no sinus infection. If you do look at the nasal cavities and have sufficient appreciation of what the things you see may mean, you will be surprised at the number of your patients whose noses betray the origin of their ear troubles. There is even more that may be said on this point, but from a different aspect. Numbers of tonsils are removed every year for the cure of recurring colds and sore throats, and when they are removed in quite a large percentage of cases the colds and sore throats continue. Why? Because the throat symptoms arose from continual post-nasal discharge from the sinuses—the red tonsils were only a part of the picture—and the so-called "cold" is always with them in their sinusitis. Nothing can be more discomforting to the surgeon than to make this mistake. I know! I've done it on more than one occasion. Would it be out of place if I mentioned one or two more complications to put you on your guard in these cases of upper respiratory infections? Firstly, orbital oedema. I have a patient who is still under my care—a girl who is little more than a child. She was taken to her doctor with oedema of the orbit and some proptosis, but apparently the cause was unrecognized. When she ultimately came under my care she was completely blind in that eye and had osteomyelitis of the frontal bone from frontal sinus and ethmoid infection. She is alive, but hideously scarred, and her optic nerve is hopelessly atrophic. Another interesting patient, whose case serves as a warning, came under my care a few months ago. This child complained that she was unable to read, and when she was taken to her family doctor he noticed that her pupils were widely dilated. She was referred to me for an opinion, and I found that her nasal cavities were full of pus. The presence of diphtheria bacilli was not demonstrable, and this, in consideration of the fact that she had pain on moving her eyes, and defective recognition of colours, as well as a lowered visual acuity, established the diagnosis of a retrobulbar neuritis from sinus involvement.

Before leaving the subject of nasal suppuration, let me remind you that a unilateral nasal discharge in a child must always raise the suspicion of the presence of a foreign body in the nose. Children have the habit of putting beads, bits of paper *et cetera* into their nasal cavities, and the presence of such an object will sooner or later give rise to a purulent discharge. This will clear up with the removal of the foreign body, unless the latter has been present sufficiently long for the infection to have spread to the antrum.

Now as to treatment. I am given to understand by one who has made a study of infantile dietetics that the free use of meat and fruit juices in the diet of a young child as a supplement to the milk and carbohydrates usually given raises the immunity against infection. In my limited experience I have found this borne out; but paediatricians will doubtless give us more definite information on this point. For older children and adults I have drawn up, and am in the habit of distributing to my patients, the following dietary rules for those subject to repeated colds and sinus infections. I have found them to be of considerable service. As far as is possible:

1. Use only fresh (not tinned or preserved) foods.
2. Restrict the use of salt to the absolute minimum.
3. Give preference to alkaline foods—vegetables, fruits, milk, potatoes, nuts. Potatoes are best baked in their jackets.
4. Avoid excess of meat, eggs and fish.
5. Reduce quantities of cereals and, as far as possible, cut out sugar.
6. In using carbohydrates avoid the refined articles, that is, use wholemeal bread, oatmeal *et cetera*, but keep within the carbohydrate limit.
7. Cream, milk, butter and olive oil are the best of the fats, and at least a quart of milk *per diem* should be taken.
8. Fruit juices, especially orange, are of the greatest value. Of other fluids, water should be taken sparingly.
9. Eating should be little and often rather than much and seldom. Patients should be encouraged to have "something between meals".
10. Avoid over-indulgence in alcohol and tobacco.

Calcium therapy (I use "Calcium Sandoz") is an extremely useful adjunct, whether in prophylaxis or in dealing with an established infection; and if you assure me that there is insufficient scientific evidence to justify its use I shall agree with you—and continue to give it. Other forms of preventive treatment, I feel sure, will be covered by Dr. Grant's remarks.

The treatment of an established sinus infection resolves itself into one of drainage. If this can be obtained without operation, so much the better. Several drugs are available. It is stated in the literature that menthol in any concentration is a dangerous drug to use locally in young children. I have no experience of this, as I have studiously

avoided it after reading of the unpleasant possibilities attending its use. Argyrol in 5% solution I have found to be an exceedingly useful therapeutic agent, but here again a note of warning must be sounded. Cases have been reported in which the uncontrolled use of this silver preparation over a number of years has resulted in the death of the patient from poisoning. A drop or two of ephedrine sulphate solution (1%) in the nostrils at frequent intervals, followed by gentle, not forcible, nose blowing or, better still, sniffing backwards, removes secretions from the nasal passages. In the case of infants, tickling the nose with cotton wool to make them sneeze is a useful procedure having the same result. I am opposed to nasal douches as being liable to carry infection to the middle ear. Some children will tolerate steam inhalations of menthol, chloroform and *Tinctura Benzoini Composita*; and these are very useful in those cases in which the little patient is not too frightened or refractory. In older children in whom the antra are well formed it may be necessary to establish drainage by performing an antrostomy, this being followed by the use of ephedrine or argyrol drops. I have often seen it recommended by rhinologists that the antra should be punctured and washed out, but my experience with children has led me to believe that the cases in which this can be done without a general anaesthetic are few and far between. If the infection does not respond to more conservative methods, I prefer to make a permanent opening through the antro-nasal wall under general anaesthesia.

As a supplement to all these measures I am convinced that autogenous vaccines have a great influence in cleaning up these infections, once efficient drainage has been established. As a prophylactic measure they have no universal applicability, but act well in individual cases.

I hope you will pardon the somewhat discursive nature of this paper, and if it seems to dismiss a very large subject with scanty comment, please attribute this to my desire to stress the practical rather than the theoretical side, and only what I consider to be the most important features of upper respiratory infections in children.

INFECTIONS OF THE UPPER RESPIRATORY TRACT IN CHILDREN.¹

By R. L. THOROLD GRANT, M.B., B.S. (Adelaide),
M.R.C.P. (London),

Honorary Assistant Physician, The Children's
Hospital, Adelaide.

If frequency of occurrence be any criterion of importance, then surely this subject is a fruitful one for discussion. For in dealing with sick children infection of the upper respiratory tract is seen

¹ Read at a meeting of the South Australian Branch of the British Medical Association on September 26, 1936.

more commonly than any other complaint. It is my endeavour in presenting this paper to convey to you impressions which I have formed, dangers I have met with, and methods of treatment which I have found useful.

Acute Naso-Pharyngitis.

Acute naso-pharyngitis is probably the commonest infection of the group, and it may vary in severity from an ordinary cold in the head to something which looks much more serious. Frequently the sick child is seen at night and the appearance strongly suggests the onset of pneumonia. The child looks ill, has a high temperature, and the respiration rate is raised. The respiration may be grunting in character. Such children are frequently admitted to the wards of the Children's Hospital with the caption: "Treat as pneumonia." The next morning the clinical picture is quite different: the temperature has subsided and the breathing is not laboured or hurried. The moral of this is to withhold the diagnosis of pneumonia from the parents in these doubtful cases until one can be quite certain of it. Simple treatment is usually effective. Put the child to bed in a warm, well-ventilated room. If the infection is spreading to the bronchial tubes an inhalation of friar's balsam in hot water is useful. I do not use menthol because I have always thought it rather irritating in its action. Benign nasal drops may be instilled if the nasal obstruction is troublesome, and aspirin is administered in the form of a suspension or powdered in jam or honey.

The chief complication of an ordinary acute naso-pharyngitis is due to the spread of the infection to the middle ear. It is imperative to examine the tympanic membranes in these cases, and this has become a simple matter with the use of an electric auroscope fitted with a magnifying lens.

The young infant will draw attention to earache by rolling of the head. The older infant will be seen to put its hand to the affected ear or ears; and, of course, the older child will voice its complaint.

Injection of the tympanic membrane is treated by instillation of glycerine and carbolic acid drops, which act as an efficient analgesic. Should the injected membrane be seen to be bulging, it must be incised. The temperature often subsides in dramatic fashion after this small operation.

The infection in acute naso-pharyngitis may spread to involve the bronchi and bronchioles, and bronchopneumonia may supervene, this being a dreaded complication in infants and much more to be feared than lobar pneumonia. Sinus infection probably occurs in most cases of acute naso-pharyngitis, and generally resolves as quickly as does the latter; but there is one form of acute sinusitis which is dangerous if not dealt with promptly. I refer to acute ethmoiditis, which is certainly not common. I can recall only two cases in children during the last ten years.

The condition produces œdema of the eyelids and perhaps of the bridge of the nose. Proptosis may supervene. The treatment is surgical.

Acute Follicular Tonsillitis.

Acute follicular tonsillitis is met with frequently, and I should like to emphasize the fact that this is a serious disease and may be followed by dire complications. The necessity for satisfying oneself that the inflammation of the tonsil is not due to diphtheria need scarcely be mentioned, as it is so well known to you. This diagnosis is not always an easy matter, for if acute tonsillitis is first seen in the later stages the exudate may cover the whole tonsil and closely mimic a diphtheritic membrane. At this stage I should like to draw attention to the menace of the "negative swab", especially one "negative swab". I recently saw a boy who had been seen by his doctor for "tonsillitis"; examination of the throat swab revealed no diphtheria bacilli. Some weeks later the boy developed a nasal voice and regurgitation of fluid through the nose on drinking. He had post-diphtheritic paralysis of the palate and he also showed evidence of myocardial damage. Strange to relate, at this stage of the illness the Klebs-Löffler bacillus was found in a swab taken from the throat.

The complications of acute follicular tonsillitis most to be feared are involvement of the heart, as in rheumatic carditis, or of the kidneys. I have seen both carditis and acute nephritis occur in the same patient—a little girl who had an attack of tonsillitis about seven days before their onset. I have seen carditis supervene in a boy with a very mild attack of tonsillitis; this patient now has well-established mitral stenosis.

Acute follicular tonsillitis is closely related to acute rheumatism in children, and it is thought by some authorities that a measure of protection may be afforded to the heart by the administration of aspirin during the acute stage of the illness and for some days afterwards.

Quinsy is a rare finding in childhood; but a condition which frequently accompanies acute tonsillitis and which also occurs separately is acute ulcerative stomatitis. Children with this complaint are sick and miserable, and it is difficult to get them to take nourishment, as mastication and deglutition are painful. The ulcers generally affect the tongue as well as the mucous membranes of the mouth. They may be seen on the palate. The gums are often swollen and bleeding. The remedy which I have found most useful for this condition is the local application, twice daily for a few days, of a freshly prepared 1% solution of gentian violet, which acts like a charm, as it also does in the treatment of thrush in babies.

Retro-Pharyngeal Abscess.

Do not forget the occasional occurrence of retro-pharyngeal abscess, a serious condition, which is commonest during the first year of life. It arises from suppuration of the retro-pharyngeal lymphatic glands following an infection of the nose or throat. There will be fever and general malaise, with some difficulty in swallowing, followed by dyspnoea with

signs of laryngeal obstruction. Neck rigidity is usual. With the tongue well depressed the swelling may be seen; palpation may reveal a fluctuant swelling. Incision is necessary with the child in the inverted position.

Acute catarrhal laryngitis is seen frequently and may give rise to much anxiety. Do not forget that it may be the herald of an attack of whooping cough or measles, as indeed may an ordinary acute nasopharyngitis. The obstruction to breathing may become considerable, with indrawing of the chest. Ordinary catarrhal laryngitis is a noisy complaint, generally of sudden onset, which will help to distinguish it from diphtheritic laryngitis.

The simple attack of croup responds well to an emetic. A steam tent may be necessary for some cases. May I draw attention to the necessity of seeing that the kettle used can in no way harm the child? I have known of scalding accidents.

Acute Laryngitis and Tracheitis due to a Staphylococcus.

There has been a number of cases of staphylococcal laryngitis and tracheitis in South Australia. Dr. F. H. Beare described the clinical condition in a paper given before this Branch a few years ago. No treatment appears to stem the advance of the disease, and when the laryngeal obstruction is considerable, tracheotomy affords no benefit.

We all know that some children are particularly prone to recurring attacks of upper respiratory tract infection, so that the question of prophylaxis becomes one of importance.

Acute follicular tonsillitis, especially if there is a history of more than one attack, will probably necessitate the subsequent enucleation of the tonsils with, in my experience, good results in regard to the general health. However, when a child with an acute nasopharyngitis has been inspected during the attack, I have frequently seen medical practitioners make the mistake of advising the parents that tonsillectomy is required. The correct procedure is an inspection of the throat at a later date, say three weeks after the cessation of acute infection, when the picture presented will be a very different one, owing to subsidence of the inflamed and swollen tissues. I agree with Dr. Jay that the removal of tonsils and adenoids does not protect a child from frequently recurring colds. I think that suitable clothing, suitable housing and suitable food do much to raise the child's resistance to infection, to which children are so frequently exposed, especially during the school-going age. I also think that the administration of a suitable vaccine may in some cases exert a prophylactic effect.

Chronic Infections.

Now let us turn to the chronic infections of the upper respiratory tract.

Certain factors predispose to chronic infection of the nasal accessory sinuses. Previous acute attacks,

of course, predispose to chronicity. Nasal obstruction or rhinitis may interfere with adequate drainage of the sinuses and so enhance the chances of chronicity of infection.

Closely bound up with the question of chronic sinus and tonsillar infection is the condition of chronic bronchiectasis so commonly seen in children. One meets with bronchiectasis in adults much less frequently, so that one is forced to conclude that a certain proportion of cases must undergo a natural resolution.

The history of the case is heard in almost standardized fashion so frequently that it merits description. The parent will state that the child has had a cough for months or years, that the cough is productive of sputum which is thick and yellowish-green in colour and may be offensive. There may be streaks of blood seen at times, and rarely an appreciable hæmoptysis. There are bouts of pyrexia and often the night sweats so dreaded by the laity. There may be a history of several attacks of "pneumonia". On inquiry usually no history of contact with the disease so feared by the parents, namely, tuberculosis, can be obtained. The cough is characteristic and, once heard, will always be remembered. It has often been described as "a cough through a bubble". On inspection of the child's fingers clubbing can frequently be detected. This usually commences in the index finger.

Now, on seeing a child like this you can be fairly sure that the intradermal tuberculin test will yield no response, and you can be more certain still that chronic sepsis of the upper respiratory tract will exist. In many quarters it is held that this upper respiratory tract sepsis is the cause of the bronchiectasis, so that treatment is naturally directed against it. I think that it is useless, however, to enucleate tonsils and remove adenoids without also attending to coincident chronic sepsis in sinuses. These children with bronchiectasis are almost certain to have infected maxillary antra, which again leads one to a difficulty: Suppose that signs of antral sepsis are the only abnormality that one can find. Should these infected antra be dealt with surgically or should one adopt a more conservative attitude?

I have seen numbers of children with chronic antral sepsis in whom no trace of this trouble could be found at a subsequent examination six or twelve months later. I hope to hear some discussion on this point, which has always been a difficulty to me.

STREPTOCOCCAL INFECTIONS.¹

By ARCHIE ASPINALL, M.B., Ch.M. (Sydney),
F.R.A.C.S.,

Honorary Surgeon, Sydney Hospital.

STREPTOCOCCAL infections are a source of great anxiety to all who practise the art of medicine—physician, surgeon and obstetrician alike. The

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on September 24, 1936.

prevention and treatment of such conditions as endocarditis, epidemic bronchopneumonia, infection of operation wounds, septicæmia following childbirth, acute *otitis media* and numerous other diseases due to the streptococcus open up a vast field for discussion. However, my rôle tonight is to touch on a few surgical conditions very briefly and allow Professor Ward, who has spent much time in research work, to deal more fully with the subject of streptococcal infections generally.

The hæmolytic streptococci are responsible for inflammatory and suppurative conditions which vary greatly in their anatomical situation, severity, and effects.

The severity of the infections bears no necessary relation to the wound. The type of lesion depends on whether there is blood invasion or not. Bacteriological examination of the blood should not be delayed if there is any doubt.

At certain times of the year streptococcal infections seem to be common. It has been suggested that they are more common in dry seasons with the prevailing dust. It has been stated that some races are more susceptible to streptococcal infections than others (Lingelsheim). During the Great War one observer noted that, whilst exposed to the same conditions, Belgian soldiers suffered less from these infections than the British troops. Among Belgian soldiers 19% of wounds became infected; British, 56%.

I propose to mention some of the more common streptococcal infections of the upper limb and to refer to one or two infections elsewhere.

As to the value of streptococcal antisera, I can only say that I have not had personal experience of its being of any definite value, as other methods of treatment have been employed at the same time. I fear that serum is often given on the "hit or miss" principle, and often it is used only when the infection is well established.

Erysipelas is seen but rarely in surgical wards today. The question of contact infection from patients with erysipelas is of importance, and opinions differ as to the necessity for strict isolation.

Chronic streptococcal infections of the skin of the finger, often associated with staphylococci, are sometimes seen. They are creeping and serpiginous in character, involving the outer layers of the epidermis. The finger is swollen, and the superficial layers of the epidermis are lifted up, forming watery, non-elevated blisters. There is very little constitutional disturbance. The treatment is to remove the elevated epidermis with sharp scissors, avoid fomentations, and apply a weak mercurial ointment.

Lymphangitis often starts from an unnoticed superficial wound of the hand. The hand and forearm swell, and red streaks running up the arm appear, with enlargement and tenderness of the antecubital or axillary glands. There may be marked prostration, fever, headache and sometimes delirium. Treatment consists of rest, application

of heat, and not making incisions. An untimely incision is fraught with danger.

Cellulitis is shown by brawny induration with swelling and tenderness of the affected part.

Treatment consists of rest and the application of heat in the first instance. When pus has formed, free incisions should be made, providing ample drainage, without the use of rubber tubes. If fomentations are applied, they should be changed frequently. Intermittent, not continuous, application of heat is best. It is important that the patient's rest should not be disturbed. Much harm can be done by the unskilful use of arm baths. If the affected part is immersed for long periods the tissues become sodden and their vitality is impaired.

Infections of the distal portion of the finger in the neighbourhood of the finger nail are a source of anxiety both to the patient and his medical attendant. The use of an unsterilized nail-brush is often responsible for the infection. Conservative treatment is advisable for a short period in most cases; but it is better to make an incision too soon than too late.

In dealing with a whitlow, avoid incisions on the palmar surface. Incisions at the side are best, as subsequent painful scar formation is avoided.

Tendon sheath infections from punctured wounds are extremely virulent. Kanavel mentions three cardinal symptoms: (i) exquisite tenderness over the course of the sheath and limited to the sheath; (ii) flexion of the fingers; (iii) exquisite pain on extending the finger, this pain being most marked at the proximal end of the finger.

The treatment is wide opening of the tendon sheath. General anaesthesia and the temporary application of a tourniquet permit of one's doing this correctly. Many hands have been sacrificed through unskilful treatment of this condition. Local anaesthesia is definitely contraindicated.

In streptococcal infection of joint cavities, for example the knee joint, repeated aspiration is often successful.

In streptococcal empyema, in my opinion, early drainage is preferable to aspiration.

In an article on phagedenic ulceration, Emile Holman (*Surgery, Gynecology and Obstetrics*, February, 1935) describes four cases of an insidiously progressive destruction of the skin following the opening of an abscess: (i) after an axillary abscess; (ii) after appendicectomy; (iii) after pricking a small pustule on the inner side of the left thigh with an ordinary pin. In his summary he states:

Four cases of progressive bacterial ulceration of skin and subcutaneous tissue are presented, one cured by maggot therapy alone, one by cautery *débridement* and maggot therapy, and one by cautery *débridement* alone. A fourth case, succumbed following repeated massive hemorrhages from eroded femoral arteries, in spite of repeated *débridements*, which were ineffectual due to the involvement of the femoral sheath.

Meleney (*Surgery, Gynecology and Obstetrics*, February, 1935) has made a special study of streptococcal infection of operation wounds. He believes that the important origins are: (i) the nose and throat of the operating personnel; (ii) the hands of the operating personnel; (iii) the skin of the patient; (iv) the air of the operating room; (v) the instruments and material used in the operation.

In prevention of infection from the nose and throat proper masking of the nose and mouth of every person in the operating theatre is invaluable. One occasionally sees the surgeon and his assistant masked, but no one else.

Meleney (*Annals of Surgery*, April, 1935) in a most interesting article refers to chronic streptococcal infection of the abdominal wall characterized by a slowly developing ulceration, without gangrene, but with extensive undermining of the skin by the liquefaction of the subcutaneous tissue and the formation of deep sinuses. Apparently the essential organism, in the cases recorded, was a micro-aerophilic hæmolytic streptococcus preferring an anaerobic environment. The disease must not be confused with acute gangrene of the skin or with chronic progressive post-operative gangrene of the synergetic type. The use of zinc peroxide (ZnO_2) in 1% gelatine or suspended in 5% pyrophosphate solution favourably changed the course of the disease and was followed by relatively rapid resolution of the process in three cases.

I should like to refer to tonsillitis followed by marked enlargement of the cervical glands under the sternomastoid muscle. I have seen several of these cases in consultation. Examination of the fauces shows the tonsils and naso-pharynx reddened and cervical glands enlarged, on one or both sides, somewhat like the enlargement seen in lymphadenoma. It is not like Ludwig's angina at all. Difficulty in swallowing is not marked; but there is considerable pain on movement of the head. The temperature may be $39.4^{\circ} C.$ ($103^{\circ} F.$) or more. The pulse is not markedly increased in rate. Culture from the tonsil shows hæmolytic streptococci. The administration of salicylate of soda is of benefit. The glandular enlargement is best treated by the application of heat. It is seldom that an incision is necessary; in fact it is often inadvisable. If an incision is made, very little pus is found; but a pure culture of the hæmolytic streptococcus is obtained. The temperature gradually subsides; but the glandular enlargement is slow in disappearing.

In conclusion, in dealing with streptococcal infections, over-treatment has to be guarded against. The patient is often exhausted by the loss of sleep caused by the constant disturbance of many methods of treatment. Again, hypnotics should be used with discretion. In my opinion morphine, judiciously used, is of more value than all the drugs so attractively advertised today.

ROBERT BOYLE AND HIS INFLUENCE ON SCIENTIFIC MEDICINE.¹

By A. R. SOUTHWOOD, M.D., M.S. (Adelaide),
M.R.C.P. (London),
Honorary Physician, Adelaide Hospital,
Adelaide.

A Period of Paradoxes.

THE seventeenth century was a turbulent time in British history. When Good Queen Bess died she left England in a strong position—nationally independent, officially Protestant in religion, yet not intolerant, and with a rapidly developing sea power. It had been a reign of peace, order, and good government. Colonial empire growth continued during the reign of James, but there was a sad recurrence of religious persecution—the High Church backed by James against the Puritans. This domestic strife became intensified when Charles I came to the throne, and the national cleavage was so great that it led to civil war. With the execution of Charles in 1649, the Stuart régime temporarily ended, and for eleven years Britain was a republic. In 1660 came the restoration of the Stuarts; the influence of Puritanism seemed to have become intolerable.

The whole century was one of struggle. There was the external struggle of England for national supremacy and the internal strife of Protestantism against Catholicism, of Parliament against King. It was a period hardly propitious for the cultivation of science and the liberal arts. Yet the period which began with the restoration of the House of Stuart and ended with its downfall is one of the most extraordinary in British history. It is a period of paradoxes. The reign of Charles II contains one of the worst and one of the brightest epochs in our national history; even rank ill-government failed to obscure a time of marvellous progress. It was a time rich in incongruities. Perhaps the very strife and turmoil stimulated the search for a better way. For, in spite of the distractions of the times, the spirit of the age was a sceptical, inquiring and reforming spirit, a spirit pervading all departments of knowledge—theology, politics, philosophy, and eventually science.

The Honourable Robert Boyle.

In 1661 there came forth from Oxford a small volume, anonymous in its source and undedicated. It was an appeal to scientists. It expressed revolt against mere authority, as if its writer had got the spirit of the time. "The Skeptical Chymist" was greatly bought up and, indeed, Latin editions of it soon appeared on the Continent. It was not long before the writer was found to be Robert Boyle.

The Honourable Robert Boyle was the seventh son and fourteenth child of the great Earl of Cork. He was born in 1626, at the beginning of the reign

¹Read at a meeting of the Historical Section of the South Australian Branch of the British Medical Association, August, 1936.

of Charles I. His father, Richard Boyle, had an adventurous history; from small beginnings in England he had emigrated to Dublin and soon became a power in the land and the possessor of considerable wealth. In 1620 Richard Boyle was created the first Earl of Cork.

Young Robert Boyle went to Eton. While there, through the stupid mistake of a careless apothecary, the boy nearly lost his life. This made him for long after "apprehend more from the physician than from the disease". It was perhaps the occasion that made him so inquisitively apply himself to the study of physic, "that he might have the less need of them that profess it". As a youth he studied with his brother on the Continent. He was at Florence in 1642, when the great Galileo died in that city. We may note in passing that another dramatic career, that of Richelieu, ended in that same year.

In 1643 the Earl of Cork died, and Robert and his brother returned to England to find the country in a state of civil war, a kingdom in arms, a nation divided into two great opposing armies. "Good God, that reasonable creatures, that call themselves Christians too, should delight in such an unnatural thing as war." There is rather a modern sound in this lamenting outburst of Robert Boyle.

For the next few years Robert lived in retirement at his manor house in Dorsetshire, the house he had inherited on the death of his father. He there studied during the unhappy times culminating in the death of Charles I. Later he returned to Ireland and for a time worked in Dublin at science and anatomical investigations under the guidance of Sir William Petty. It was Petty who made the graceful epigram in referring to a certain Dr. Walmsley: "His mountain-bellied conceptions for the good of mankind brought forth abortive mice."

Later, Boyle went to Oxford and was the companion of other famous men—Sir Christopher Wren (the doctor-architect), Willis (the anatomist and discoverer of diabetes), Dr. Goddard, and many others. In the years of the Protectorate and on to the coming of Charles II, Boyle slowly and laboriously amassed and examined evidences that were to break down the old mistaken notions of Greek and mediæval philosophy and to build up on a new and sure foundation the mighty structure of physical and chemical science. On this sure foundation Newton and Dalton and later workers built.

In 1670 Boyle was taken ill with what he describes as a severe paralytic distemper.

Cordial medicines, especially such as peculiarly befriend the genus nervosum, were very frequently and not unsuccessfully administered. The dried flesh of vipers seemed to be one of the usefulest cordials I took. The best thing I found to strengthen my feet and legs was sack turned to a brine with sea salt and well rubbed upon the parts every morning and night with a warm hand.

Gradually Boyle regained the power of his limbs, and he continued to do useful work almost to the time of his death in 1691. He was buried at Saint Martin-in-the-Fields, in the very heart of London; Trafalgar Square, the National Gallery and the

Royal College of Physicians bear him close company. At one time Boyle was elected President of the Royal Society, but he declined the office, objecting to the taking of a formal oath. It has also been said that, had he wished, Boyle might have been a peer or a bishop or the provost of Eton, but, as he puts it himself, "he felt no inward motion to it by the Holy Ghost".

The Royal Society.

In 1645 there began in London a little club of a few scientists, many of them medical men, calling itself "The Invisible College". These curious gentlemen applied themselves to the study of experimental science, "the new philosophy". They held weekly meetings at each other's lodgings in London or at Gresham College, "to discourse and consider of philosophical inquiries and such as related thereto, precluding matters of theology and State affairs". Part of the company removed to Oxford, and, when Boyle followed them in 1654, the philosophers thereafter met weekly at his lodgings. From such small beginnings grew the great Royal Society of London for improving Natural Knowledge, incorporated by Charles II in 1663. In the charter Boyle is named as one of the Council.

The establishment of the Royal Society is a landmark in the history of science. To some it may appear a sort of scientific kindergarten. Knowledge was sought not from old books, but from pots and pans and pendulums. It was the experimental method, and the scientists were taking to task the whole universe—the world was their oyster.

At the outset the society had a good deal of opposition, and had to bear much ridicule and satire. Samuel Butler, who satirized Puritanism so vigorously, also poked fun at the scientists: "Their learned speculations and all their constant occupations—to measure and to weigh the air and turn a circle to a square." But the society was soon to triumph. The great plague of 1665 and the fire of 1666 gave the Royal Society an opportunity, and much of what was good in the arrangement of the new city was the result of their deliberations and counsel.

Pepys's Diary.

A good idea of the life of the times is conveyed by Pepys's Diary, which covers the ten-year period of 1660 to 1670. Much of the diary is trivial tittle-tattle, but it is withal an interesting and certainly an intimate review of the times.

Pepys makes several references to the plague. On April 30, 1665:

Great fears of the sicknesse here in the City, it being said that two or three houses are already shut up. God preserve us all!

June 7, 1665, he described as

... the hottest day that ever I felt in my life. This day, much against my will, I did in Drury Lane see two or three houses marked with a red cross upon the doors, and "Lord have mercy upon us" writ there; which was a sad sight to me, being the first of the kind that to my remembrance I ever saw.

There are many references to the Royal Society. A meeting on February 15, 1665, is described:

But it is a most acceptable thing to hear their discourse, and see their experiments; which were this day on fire, and how it goes out in a place where the ayre is not free, and sooner out where the ayre is exhausted, which they showed by an engine on purpose. After this being done, they to the Crown Tavern, behind the 'Change, and there my Lord and most of the company to a club supper; Sir P. Neale, Sir R. Murrey, Dr. Clerke, Dr. Whistler, Dr. Goddard, and others, of the most eminent worth. Above all, Mr. Boyle was at the meeting, and above him Mr. Hooke, who is the most, and promises the least, of any man in the world that ever I saw. Here excellent discourse till ten at night, and then home.

Pepys took advice from Boyle on whom he should consult about his eyes. Dr. Turberville, of Salisbury, was recommended.

He did discourse, I thought, learnedly about them; and takes time, before he did prescribe me anything, to think about it.

Pepys was planning to see Dr. Lowre dissect several eyes of sheep and oxen, and Turberville was anxious to be present at the demonstration.

But strange that this Turberville should be so great a man, and yet to this day had seen no eyes dissected, or but once, but desired this Dr. Lowre to give him the opportunity to see him dissect some.

Boyle's Experiments.

Science now had become fashionable, and Boyle's pneumatic engine in 1658 became the talk of London. The "engine" was a large pear-shaped vessel, at the top fitted with a stopper and at the bottom connected with a brass cylinder which was a piston worked with a rack and pinion. Working the "engine" produced a partial vacuum, and Boyle studied the effect of the lowered pressure on shrivelled apples, on balloons, and on human limbs. A quotation from Evelyn's Diary provides a good description of traumatic purpura:

I waited on Prince Rupert to our Assembly, where we tried several experiments in Mr. Boyle's vacuum: a man thrusts in his arm; upon exhaustion of the air, had his flesh immediately swelled so as the blood was nearly bursting the veins. In drawing it out we found it all speckled.

By the aid of his machine Boyle established the truth of his law that the volume of a gas was inversely proportional to the pressure to which it was subjected—doubling the pressure halved the volume. We perhaps smile at the simplicity of the experiments; yet we have the advantage of standing on the shoulders of our ancestors to reach the fruits from the tree of knowledge. To appreciate the true importance of Boyle's work, illustrated by his simple experiments with the pneumatic engine and such apparatus, we must remember that Aristotle's doctrine on the constitution of matter had held sway for nearly 2,000 years. The scientific renaissance was to break the spell.

Following more ancient writers, Aristotle, in the period 300 B.C., held that there were four primary and opposite fundamental qualities: the hot and the cold, the wet and the dry, these combining in pairs

to constitute the four essences or "existences" which enter in varying proportions in the constitution of all matter. These elements were earth, air, fire and water. Thus water was made up of the two qualities, wet and cold; fire, of the two qualities, hot and dry. Later writers linked up with this doctrine the old Hippocratic one on the bodily constitution—that the body was composed of four humours. Until it began to be undermined by Robert Boyle and others in the seventeenth century, the doctrine of the four elements had persisted in its entirety, while ideas and terms derived from the old humoral pathology can be traced in the medicine of the twentieth century.

Up to and beyond the days of Paracelsus in the sixteenth century, chemistry, or alchemy, and medicine were linked. Paracelsus, capable physician and surgeon though he was—and some have called him the founder of chemical pharmacology and therapeutics—was steeped in the alchemy and black magic of the times. Yet a new trail was being blazed, and, following the work of Paracelsus and of Vesalius and Paré, the progress in anatomy and physiology in the seventeenth century was remarkable.

Thomas Sydenham.

If we call Boyle the founder of chemistry, we must call Sydenham the founder of the modern science of epidemiology. Unlike Boyle, Sydenham took an active part in the Civil War; he was a Puritan captain of horse, and was sometimes in later years called "the trooper turned physician". As the great Harvey was the master of medical science, so Sydenham—the English Hippocrates—was the master of medical practice. His methods were simple and practical. Personal observation, he said, and personal observation alone, could unravel the mysteries of disease.

Sydenham, too, we see had got the inquiring spirit of the times. He had a great regard for Boyle and praised his methods, and perhaps gained much from his stimulating example. Sydenham dedicated his book "On the Treatment of Fevers" to the Honourable Robert Boyle. The flowery language, so characteristic of the times, strikes strangely on modern ears.

To The

Most Illustrious and Most Excellent

Master Robert Boyle.

Most Truly Noble Sir,

To such a degree does anything, in any way appertaining to a person so truly and wholly noble as yourself, awaken the immediate attention of good and learned men, that I can at once foresee the avidity with which they will inquire into the grounds and reasons, whereon I have relied in venturing to crave the authority of a name so greatly celebrated as your own, as a warrant to this, my work.

It is no part of my intention to descend into the details of your praise, or to enlarge upon the transcendancy of your parts; although these last are so great as to raise you to the level of the most famous names of foregone ages, such indeed, as would have enriched any author with an exuberant supply of subject-matter, and have honoured

any book whereof they stood at the head. All this, however, is shown in full by your own published Treatises; having which, you require no second herald, whose subsidiary voice should swell the loud note of your celebrity. These trite and commonplace arguments I discard, and I profess to have placed my work under your patronage for the two following reasons: It was on your persuasion and recommendation that I undertook the subject; and it is by your own experience that the truth and efficacy of some of the matters delivered in the Treatise, have occasionally been tested. Hence you are made a sufficient witness; since in the fulness of your humanity you have gone so far as to accompany me in the visiting of the sick. Herein you have exhibited a kind spirit, descending to offices, which, however honorable, are little recognised by the spirit of the age we live in.

I must add, most illustrious Sir, that the object of the present epistle will be fully attained if I succeed in craving pardon for my boldness in the use of your name, and in making a most grateful acknowledgment of your many services towards me. In all cases I shall owe you a debt of gratitude for manifold kindnesses, and never cease to be your most obliged and humble servant,

[1666.]

THOMAS SYDENHAM.

"The Oxford Quartette."

After Harvey's death there were four men who made striking contributions to medical science. They have been called "The Oxford Quartette". They were Boyle, Robert Hooke (his assistant), John Mayow and Richard Lower. Their work marks an important step in what Clifford Allbutt has termed "the pathetic quest for oxygen". Mayow, indeed, came very near to discovering oxygen. He found that dark venous blood was changed to bright red by taking up something from the air, something he called igneo-aerial particles.

Mayow was a chemist and physiologist of true genius. Chemical biology owes much to his work. He probed into the question of the use of respiration. Why do we breathe? The old conceptions of respiratory function—that it was to cool the blood, to draw the blood through the lungs, or to keep the blood in a fluid state—did not satisfy Mayow. It was, of course, left for Lavoisier in 1775 to discover oxygen and to elicit the true nature of gaseous interchange. Lavoisier was guillotined by the French revolutionists—what need for science in a republic?

Boyle's Wide Influence.

Like many of his time, Robert Boyle was a student of divinity as well as of science. Not only did he write "The Skeptical Chymist", "Physiological Considerations" and other scientific works, but he also wrote "Occasional Reflections and Meditations". He saw in science something of the wise providence of the Divine. On the Restoration Boyle was offered church preferment, but he declined receiving holy orders, thinking he could do more service to religion as a layman. Throughout his life he gave liberally toward the advancement of religion and learning, and in his will he made provision for a series of annual lectures. The Boyle Lectures, thus instituted, were in the nature of a defence of Christianity on a scientific basis, a "proof

of religion against atheists and other notorious infidels".

As a leader in the scientific renaissance Boyle can never be forgotten. In his whole life work he was associated with physicians, and most of the subjects he inquired into bear closely on medical science and practice. He was the founder of chemistry. His continual emphasis on the value of observation stimulated other workers. The spirit of inquiry of the age was fostered by his enthusiasm. He was the leader at the Royal Society meetings, where physicians and other scientists discussed their problems, and through his work the studies of respiration, blood circulation, and of many other fields of medical biology were clarified. His summing up of the aims of science is as true today as when it was written:

The book of Nature is a fine and large piece of tapestry rolled up—which we are not able to see all at once—but must be content to wait for the discovery of its beauty and symmetry, little by little, as it gradually comes to be more and more unfolded or displayed.

Boyle wrote it nearly three hundred years ago, and through the ages inquiring minds like his will continue to probe the secrets of medical science. His influence lives.

THE RESULT OF THE ROUTINE USE OF THE WASSERMANN TEST IN 3,404 PATIENTS ATTENDING FOR ANTE-NATAL CARE.

By T. DIXON HUGHES, M.B., Ch.M. (Sydney),
F.R.A.C.S., M.C.O.G.,

AND

CHARLOTTE GAMMIE, M.B., B.S. (Sydney),

(From the Obstetrical Department, The Women's Hospital, Crown Street, Sydney.)

From time to time various statements have been made concerning the percentage of syphilitic patients among those attending for ante-natal treatment in Australia. The figure generally quoted is 10%. The only report on any large series that has yet been made in Australia is that of Jago, who found the incidence to be 4% in a series of 1,012 patients. In Table I the incidence found in various series throughout the world is shown.

TABLE I.
The Incidence of Syphilis Found among Women Attending for Ante-natal Treatment at Various Hospitals.

Hospital.	Number of Patients.	Number of Positive Reactions.	Percentage.
The Women's Hospital, Melbourne	1,012	41	4.0
Royal Edinburgh Hospital	2,000	130	6.5
Gammelftoft, Copenhagen	2,200	148	6.7

It was thought to be of national importance that this matter should be settled and an attempt made to free the State of the burden of such a large potential congenital syphilitic population. There-

fore the present investigation was commenced in March, 1933. The object was to perform the Wassermann test on every patient as part of the routine ante-natal examination, irrespective of age, parity or social condition. The patients attending the hospital are of the average hospital type, varying from residents of the out-of-work camps to those in more comfortable circumstances. It was thought by many that strong objection would be taken by the patients to this procedure; but this has not been our experience. After the first few weeks the patients accepted the procedure with equanimity and the numbers attending did not decrease.

In all, 3,404 patients were tested, 3,016 of the tests being true routine tests. The remaining 388 are from another out-patient day, and are a routine test on all *primipara*, and therefore these are added when discussing the incidence among *primiparae*.

TABLE II.
The Results of Tests carried out in this Investigation.

	Number of Patients.	Number of Positive Reactions.	Percentage.
Routine test (every patient attending for ante-natal care) . .	3,016	32	1.06
Routine, <i>multiparae</i> only	1,908	25	1.31
Routine, <i>primiparae</i> , including 388 from clinic testing <i>primiparae</i> only	1,496	7	0.47

Table II shows that among the 3,016 patients who were submitted to a routine test as part of the ante-natal examination, irrespective of parity, age or any other condition, the Wassermann reaction was found to be positive 32 times, or in 1.06% of patients;

and when we examine the incidence in *multiparous* and *primiparous* women, we find that in the *multiparous* it is 1.31% and in the *primiparous* 0.47%; that is, about three times as high in the *multiparous*. Whilst not conforming to the apparently popular belief of 10%, it shows a definite percentage of syphilitic patients, which would not otherwise be detected, and in the case of our own hospital, with approximately 2,500 confinements per year, would amount to the detection of at least 25 unrecognized cases, with their trail of disaster. An outstanding fact elicited in the investigation was the utter lack of previous history, which might have given a clue to the possibility of a positive result; in other words, if the test had not been done as a routine, but only in suspicious cases, the great majority would have been missed, especially in those *multiparae* whose previous pregnancies had been normal. A glance at Table III will illustrate this point more fully. It will be seen that 10 out of 24 *multiparae* with a positive Wassermann reaction have no history of miscarriage, premature labour, neo-natal death or stillbirth, infection occurring apparently after the birth of the last child, or not showing up in the children till a later date, and thus giving a misleading history. The fact remains, however, that these cases will not be detected unless a Wassermann test is carried out as a routine procedure.

When the serum reacted to the Wassermann test the patient was referred to the Rachel Forster Hospital Clinic for treatment if she was some distance from term. Otherwise she was admitted to the Isolation Department of the Women's Hospital and an intensive form of treatment given. We should like to take this opportunity of thanking the members of the Rachel Forster Hospital staff for their close cooperation and help.

TABLE III.
The Previous History of *Multiparae*.

Patient's Number.	Number of Pregnancy.	Premature Labour.	Neo-natal Death.	Miscarriage.	Stillbirth.	Remarks.
4	Second	—	—	—	—	All children alive.
5	Fifth	—	—	—	—	All children alive.
6	Ninth	—	—	—	—	All children alive.
7	Eighth	—	—	—	—	All children alive.
10	Third	—	—	—	—	All children alive.
12	Fifth	—	—	—	—	All children alive.
13	Second	—	—	—	—	
15	Second	—	—	—	—	
17	Third	—	—	—	—	
24	Sixth	—	—	—	—	Five alive.
8	Fourth	—	—	1	—	Fourth pregnancy—miscarriage.
9	Fifth	—	—	1	—	Fifth pregnancy—miscarriage.
20	Sixth	—	—	1	—	1st pregnancy—miscarriage.
1	Eighteenth	—	—	—	1	Seventeenth stillborn.
22	Fourth	—	—	2	1	First stillborn, then two miscarriages.
23	Sixth	—	—	—	1	Fourth stillborn.
16	Second	—	—	—	1	Premature.
14	Second	—	—	—	1	Premature.
2	Twelfth	—	1	—	1	Second stillborn.
11	Third	—	1	—	—	Age not known.

Of the 32 patients who reacted to the Wassermann test, 25 were subsequently followed up. The remaining seven disappeared. The figures shown in Table IV give much food for thought in the sphere of preventive medicine. In addition, several of the children born alive reacted to the Wassermann test. But we shall not discuss this aspect, as too many factors are involved, such as the length of antisyphilitic treatment given before delivery and the reliability of the Wassermann test in the early weeks of infant life.

TABLE IV.

Patients reacting to the Wassermann test	25
Children born alive	20
Macerated	3
Neo-natal death	2
Combined stillbirths and neo-natal deaths	5
		(20%)

Jago carried out a Wassermann test in 22 patients who were delivered of a macerated foetus, and found the result positive in eight cases, or in 36.3% of cases. Although this figure is high, our results confirm it to some extent, as all our patients had some treatment according to the period of pregnancy at which they presented themselves, and no doubt the macerated stillborn rate would have been still higher had the majority of patients not had at least one full course of treatment.

It is apparent from the experience of other clinics and the foregoing routine examination of 3,000 odd patients that unsuspected syphilis is present in at least 1% of all patients attending for ante-natal care. It is useless to judge results on a few cases; for, as it was very interesting to note in compiling these figures, there were some hundreds without a positive reaction, then two or three occurring in quick succession.

At first this figure may appear small and of no importance; but a little reflection will show its material and economic importance; because, taking for example our own figures of 25 cases per year, it means that 25 mothers, 25 children and 25 fathers are probably infected, and surely it is worth while to endeavour to save the children alone from the stigma of syphilis. Admittedly some will be still-born if the patient presents herself late in pregnancy; but those to follow will have a better chance in life. And therefore it behoves those in charge of ante-natal departments to stir themselves from their apathy and seize the opportunity of carrying out some preventive medicine which will aid mankind, the nation, and, if self must be added, the statistics of their clinics.

If this paper stimulates one thinking person to carry out routine Wassermann tests at an ante-natal clinic, then will be set in motion the cogs that will ultimately save many hundreds of lives and relieve generations to come of much unnecessary misery and suffering.

Acknowledgements.

In conclusion we wish to thank the Board of Health, and particularly Dr. Dalyell for her help in carrying out these tests and the encouragement and advice she has given us from time to time.

LOCAL ANÆSTHESIA IN ABDOMINAL SURGERY.¹

By V. J. KINSELLA,
Sydney.

It is not intended in this address to deal with the whole subject of local anæsthesia in abdominal surgery nor to give a detailed account of the varying techniques. There are on the market several good text-books of local anæsthesia which will suffice for those who are interested. Rather is it intended to give a sketchy account of personal impressions.

My interest in the subject was first aroused in Vienna by the work of Professor Hans Finsterer, who is probably the doyen of abdominal surgeons on the Continent. The volume of his work is tremendous. Two years ago he reported his results in benign affections of the stomach, including 1,658 gastrectomies. I had hopes that Finsterer or von Eiselsberg could help me with their ideas on the mechanism of pain production in peptic ulcer. Perhaps they knew whether the actual ulcer was tender on direct palpation, because they had operated upon so many stomachs under local anæsthesia. But they had no interest in the subject. It appeared quite simple to them—the acid must cause the pain, because alkalis give relief. Moreover, it was not possible to tell, because the patient always had much morphine. Soon after arriving in Vienna I attended a lecture-demonstration given by Finsterer on his methods of anæsthesia. As he spoke he carried out the injections on the cadaver with methylene blue, and made rapid dissections to show that he had placed the solution where he said he was placing it.

Soon afterwards I attended Finsterer's operations. He does no public hospital work. His operations are nearly all abdominal, particularly upon the alimentary canal, and mostly major ones. His visitors are frequently asked to assist him, possibly because his operations take such a long time. I first received the invitation because an enormous Teuton already helping him quite blocked the view of the onlookers.

The first operation at which I assisted was a gastrectomy and resection of segments of colon and jejunum for an anastomotic ulcer with gastro-colic fistula following gastro-enterostomy. The operation took five hours.

¹ Read at a staff meeting of the Saint Vincent's Hospital, Sydney, June, 1936.

The next operation at which I assisted was upon a corpulent woman with an extensive carcinoma of the stomach. A complete removal of the stomach with the lower half inch of œsophagus was performed. The œsophagus was then anastomosed end-to-side with jejunum, an anastomosis with a very long stoma was made between afferent and efferent loops of jejunum, and then a jejunostomy was made distal to this for feeding and drainage. The operation by this time had lasted nearly five and a half hours, and it was concluded by removing the normal appendix. These operations were typical of many which I witnessed.

The condition of the patients after operation surprised me. I took advantage of the invitation to examine them immediately afterwards and also upon the following day. I was already thoroughly familiar with the clinical aspects of patients after major abdominal operations performed by master surgeons under general anaesthesia. The condition of the patients operated upon under local anaesthesia was far superior to that seen after general anaesthesia. My notes of Finsterer's cases, made on the spot, typically contain such remarks as those appended to the two operations mentioned above: "At the end of five hours patient was in remarkably good condition—pulse slow and full." "Pulse quite good at finish—strong and slow. Colour good (slightly suffused). No shock." The outstanding feature was the absence of shock. Patients who might be expected to need intravenous injections of fluid or blood transfusions appeared little the worse for their tremendous operations.

Finsterer attributes this comparative absence of shock to his use of local anaesthesia. It is probably due to: (i) the prevention of nociceptive impulses from reaching the central nervous system; (ii) the absence of the toxic action on the parenchymatous organs, which has been demonstrated by Crile and others to occur during prolonged general anaesthesia; and (iii) the extra gentleness necessary in operating.

It appears, then, that local anaesthesia is particularly indicated in very sick patients, for instance, those with carcinoma, obstruction to the common bile duct, cachexia from other causes, and cardiac or pulmonary diseases. Finsterer looks upon hæmorrhage from a chronic peptic ulcer as an absolute indication for operating within twenty-four to forty-eight hours. His results are impressive—a mortality of 4.3% in those cases operated upon in the first twenty-four to forty-eight hours. For him there are no contraindications. In spite of this acceptance of the gravest risks, his mortality for gastrectomy for benign lesions in patients between sixty and eighty years of age is but 2%.

My own experience with the method has been gratifying. Some typical cases are instructive.

Case I.

M.W., a diabetic woman, aged sixty-eight years, was admitted to Saint Vincent's Hospital, Sydney, having been jaundiced for two weeks and having severe attacks of

biliary colic and vomiting. Her temperature was raised and her pulse rate was 140 on her admission to hospital. On account of the severe pains it was thought best to spend no more than two days in pre-operative treatment. "Omnopon", 0.045 gramme (two-thirds of a grain), and scopolamine, 0.00043 gramme (one one-hundred-and-fiftieth of a grain), were then given in divided doses and the abdomen was opened under field block anaesthesia. A thickened gall-bladder, tightly contracted on some large stones, was discovered and removed, together with two stones tightly impacted in the lower end of the thickened common duct. To remove these latter stones it was necessary to "milk" the duct and at the same time to use a scoop within it. The narrow lower end of the duct was then dilated by the passage of Hegar dilators up to size 9/12. These manipulations required some force, and the interesting point is that no local anaesthesia was required beyond the field block of the abdominal wall. The condition of this very debilitated patient at the conclusion of the operation was gratifying. She seemed none the worse for her ordeal, and convalescence proceeded smoothly.

Case II.

The next patient, Mrs. M.W., aged sixty-four years, was under the care of Dr. F. A. E. Lawes at the Hornsby Hospital. She had been extremely ill for two days, with marked myocardial inefficiency, indicated by orthopnoea, an enlarged heart, and a pulse rate of 160. At the same time she was suffering from severe biliary colic. There was no enlargement of the liver, no œdema, and no signs at the pulmonary bases. After prolonged rest her cardiac condition returned to its normal state, in which she could walk slowly without dyspnoea, but could not undertake any further exertion. There was still tenderness over the gall-bladder and the Graham's test showed that it was not performing its normal function. The patient had had previous similar attacks, in one of which Dr. Lawes had secured her admission to another hospital. He wished to have the gall-bladder removed, but the surgeon feared that the condition of the heart was not good enough to permit operation. However, it became clear that the attacks of biliary colic temporarily aggravated the myocardial insufficiency and reduced the patient to a very grave condition. Moreover, it was possible that the diseased gall-bladder played a direct toxic or nervous part in causing the myocardial degeneration. (The association of cardiac and gall-bladder disease was discussed by Boyd Campbell in *The British Medical Journal*, April 13, 1936.) It appeared that the operation could be undertaken with reasonable safety in the quiescent interval, if local anaesthesia were used. And so a thickened strawberry gall-bladder was removed. It was again interesting to note that no further anaesthetic was needed than the "Omnopon" and scopolamine and the field block of the abdominal wall. Convalescence was smooth, and the patient remained very well for about four months and was shown at a meeting of the Kuring-gai Medical Association by Dr. Lawes. But at the end of this time the dyspnoea became worse, and now, five months after her operation, the patient is in hospital with orthopnoea, cardiac œdema and *pulsus alternans*, but without her biliary colic. This operation, uneventful under local anaesthesia, would probably have ended in disaster under general anaesthesia.

Case III.

Mrs. C.B., aged sixty-eight years, was admitted to the Community Hospital at Chatswood on account of a severe hæmorrhage from a chronic duodenal ulcer. She had been treated for epilepsy for many years. Medical treatment and blood transfusions failed to stop the bleeding, and on the twentieth day after her admission to hospital it was decided to operate, in spite of the patient's very poor general condition. The abdomen was opened under field block, following the administration of "Omnopon" and scopolamine. Blood transfusion was carried out at the same time by Dr. A. W. Gray. A duodenal ulcer was over-sewn, associated vessels were ligated and a gastro-jejunostomy was performed. The patient was of visceroprotic habitus and no further anaesthetic was required beyond a

subperitoneal injection about the first part of the duodenum and into the transverse mesocolon. The patient appeared to be in a better condition immediately after this procedure than upon arrival in the theatre. All went well; the stools became lighter and finally normal in colour; but on the fourth day the patient had two severe epileptic fits and died in the second fit.

Case IV.

Mrs. C., aged forty-five years, was admitted to Saint Vincent's Hospital suffering from attacks of biliary colic and *angina pectoris*. In the last few months she had noticed palpitations and dyspnoea on slight exertion. The electrocardiogram showed low voltage changes suggesting myocardial damage. Dr. R. J. Taylor saw this patient for me and advised that the gall-bladder should be removed. The patient was given "Omnopon" and scopolamine and the abdomen was opened under field block anaesthesia. A whitish nodule about as large as a walnut was seen in the liver. An attempt to explore the abdomen roused the patient and made necessary the administration of gas and oxygen. No lesion was found except the thickened gall-bladder, containing a small stone, and removal of the gall-bladder, commenced under gas, was completed without general anaesthesia. The patient convalesced smoothly.

The above few cases, chosen from a limited experience, suggest the utility of local anaesthesia in the "bad-risk case". If it makes the "bad-risk" safer, the question naturally arises whether or not it should be a routine method.

Finsterer's Technique.

Perhaps a very short description of the technique used by Finsterer for work in the upper part of the abdomen may not be out of place. He gives two centigrammes of "Pantopon" one hour before operation, and one or two centigrammes of morphine with half a milligramme of atropine a quarter of an hour before. These represent the doses for a strong adult of average size. A field block of the abdominal wall is carried out through six skin wheals as shown in Figure I. The "Novocain" solution (0.5%

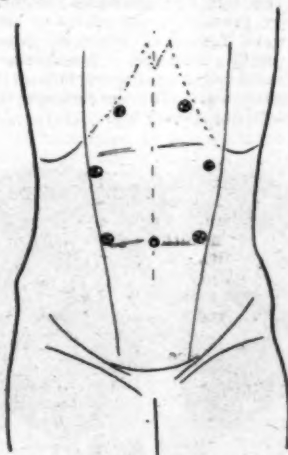


FIGURE I.

as a rule, 0.25% if the patient is very ill) with adrenaline is placed in the rectus sheath behind the rectus muscle. At this point the thoracic nerves are blocked as they enter the rectus muscle from behind. As the injection proceeds the relaxation of the rectus muscles becomes apparent. The abdomen

is then opened, the margins of the incision are held up, and "Novocain" is injected from within into the subperitoneal tissues as far from the incision as possible. Skin towels and retractors are then put in place. The next step depends on circumstances. It may be possible, as in two of the above cases, to proceed without further anaesthesia. Otherwise it may be necessary to make the injection in the neighbourhood of the vessels (mesenteric anaesthesia). However, if the viscera are not mobile and the mesenteries are short, it is necessary to anaesthetize the attachments of the viscera by splanchnic anaesthesia. A short gas anaesthetic is usually necessary for this manoeuvre. (It is important to note that this supplementary gas anaesthesia is dangerous unless it is kept light and the anaesthetic is given carefully by a skilled anaesthetist.) The liver is held up by the assistant and the stomach is drawn down by the operator's right hand. The operator's left middle finger is then pressed against the vertebral column, above the lesser curvature of the stomach, so that it rests between the aorta to the left and the inferior *vena cava* to the right. Finsterer removes the glove from the left hand for this step. The breadth of the finger serves to press aside the great vessels and to make a safe way for the long splanchnic needle, which is taken in the right hand and passed along the middle finger of the left hand to the vertebral column in which it is fixed. The piston of the syringe is then withdrawn and, if no blood appears, 80 cubic centimetres of 0.5% "Novocain" (for a strong man) are injected into the retroperitoneal tissue. I have had but two personal experiences of this manoeuvre, in cases of gastrectomy, and it was very satisfactory in each case.

During the operation gentleness must be particularly observed. For example, it is found that under general anaesthesia mesenteries or pedicles may be transfixed by sharply pushing through them a ligature carrier. But under local anaesthesia it may not be permissible to push the instrument through until an incision is made over its point. Retraction and "packing off" must be done with extreme gentleness. Force and dragging are out of the question.

Conclusion.

To conclude, it may be pointed out that the method is gaining ground. It is often said that the British patient does not possess a favourable temperament for local anaesthesia; but the temperament must be becoming more favourable as surgeons become more familiar with the method. It is sometimes said that "local anaesthesia flourishes exceedingly where general anaesthesia is bad". This is not the whole truth, but rather a half truth of the kind so effective in the hands of advocates and so hateful in the eyes of philosophers. However, it appears clear that local anaesthesia in abdominal surgery is destined to play an important part, especially when the operation is of great severity or the patient is gravely ill.

Reports of Cases.

ACUTE IDIOPATHIC APLASTIC ANÆMIA.

By ALEX. MURPHY, M.C., M.B., Ch.M.,
Honorary Physician, Brisbane Hospital.

Clinical History.

A DAIRY FARMER, aged forty-five years, was admitted to the Brisbane Hospital on November 19, 1935. His father was still alive, aged ninety, and his mother died of old age. He had never been ill in his life. A fortnight previously he had treated one of his cows for abortion.

Twelve days prior to his admission to hospital blue spots had appeared on his body, but at that time he did not feel ill in any way. The spots faded gradually, but seven days later he developed a severe headache, which passed off on the same day. Since then he had had daily headache and had felt generally "out of sorts".

Examination revealed a man of good physique, looking desperately ill. He had a pale skin of icteric hue. His conjunctivæ were pale, the retinæ were pale, but showed no hæmorrhages. The tongue was coated, the teeth were artificial, many petechiæ were present on the soft palate. The heart sounds were clear. The systolic blood pressure was 110 and the diastolic pressure was 60 millimetres of mercury. The spleen was not palpable. No glandular enlargement was present. Small purpuric spots were present on the abdomen, back and legs, mostly fading. A large ecchymosis was present on the right shin. The patient's temperature was 37.9° C. (100.2° F.); his pulse rate was 100 per minute. The urine was acid, its specific gravity was 1022, and it contained neither albumin nor sugar.

The erythrocytes numbered 2,000,000 per cubic millimetre, the hæmoglobin value was 30%, and the colour index was 0.7. The white cells numbered 3,300 per cubic millimetre. Neutrophil cells were 11%, lymphocytes were 87% (all small and mature), eosinophil cells were 2%. Platelets were too few to be counted. No reticulocytes were present. The serum failed to agglutinate *Brucella abortus*.

A provisional diagnosis of Werlhof's disease was made on the patient's admission to hospital, but on receipt of the blood findings this was altered to aplastic anemia. On November 20 a transfusion of 540 cubic centimetres (eighteen ounces) of blood was given, and six hourly injections of adrenaline in doses of 0.3 cubic centimetre (five minims) were instituted.

On November 22 the purpuric rash and the large ecchymosis had almost disappeared, and the patient remained cheerful and made no complaint apart from feeling weak, though he still looked very ill.

On November 25 there was a small epistaxis and fresh petechiæ appeared on the palate. A blood count on this day showed the erythrocytes to number 2,100,000 per cubic millimetre. The hæmoglobin value was 36%; the colour index was 0.8. The platelets numbered 17,850 per cubic millimetre.

A second transfusion was given on November 27. On November 29 the patient complained of severe headache and had a rigor.

On December 1, four days after the second transfusion, the erythrocytes numbered 1,210,000 per cubic millimetre, the hæmoglobin value was 21% and the colour index was 0.9. The white cells numbered 1,800 per cubic millimetre. Neutrophil cells were 7% and lymphocytes 93%. Only two platelets were seen. No reticulocytes were seen. On the following day the patient's condition manifested a rapid change; his temperature rose to 40.5° C. (105° F.), he talked at random and was drowsy and irritable. This passed into a well-defined state of cerebral irritation, in which he lay curled up on his left side, and led to the conclusion that hæmorrhages had occurred in the brain. On December 5 loss of control of the sphincters occurred and was followed by coma and death, twenty-eight days after the first appearance of the purpuric rash. Fever with daily fluctuation was present throughout.

Post Mortem Findings.

Autopsy showed the lungs to be rather oedematous; the right base was congested and consolidated. The heart weighed 290 grammes and was peppered all over, but especially on the posterior aspect, with small hæmorrhages (see Figure I), many in the myocardium. The spleen



FIGURE I.

weighed 225 grammes and was firm and of good colour. The liver was normal. The right kidney weighed 160 grammes and the left 130 grammes; some tiny hæmorrhagic spots were present in the pelvis of both. Numerous hæmorrhages were found at intervals along the whole length of the small intestine. Numerous hæmorrhagic points were present all over the surface of the brain and in the brain substance. The cerebellum showed intense hæmorrhagic mottling (see Figure II).



FIGURE II.

Macroscopically the sternal marrow was much paler than normal. Its colour was that of a faint rusty brown with patchy areas of yellowish fatty appearance.

Microscopically the sternal marrow, as the photomicrograph (Figure III) shows, was markedly non-cellular, reflecting the macroscopic appearance well, revealing fatty areas of large size with a few clumps of cells here and there. The cells were almost wholly lymphocytes, with a very few normoblasts. There was no hæmopoietic reaction, there being no megaloblasts, no megakaryocytes and no myelocytes.



FIGURE III.

The liver was normal. The spleen, apart from numerous trabeculae of fibrous tissue, was normal. Kidneys showed only a few small hæmorrhages. The heart muscle showed many such hæmorrhages.

Comment.

Idiopathic aplastic anaemia is extremely rare. Mills⁽¹⁾ states that "probably fewer than 20 cases with *post mortem* findings were reported during a five-year period when the attention of the medical world was focussed upon anaemia and its treatment". Many reported cases fail to sustain the diagnosis in the face of close scrutiny, marrow aplasia in leuchæmia of the aleuchæmic type being the principal source of error.

The differential diagnosis is from Werlhof's disease, the aplastic stage of Addison's anaemia, malignant neutropenia, and leuchæmia in the aleuchæmic phase.

In this case repeated interrogation failed to shake the patient's statement that he felt perfectly well until five days prior to his admission to hospital; he denied having been in the least degree breathless or easily fatigued, and this would seem to establish the acute nature of the process. The reduction of red cells, granular leucocytes and platelets, combined with the widespread petechiae and microscopic appearance of the spleen⁽²⁾ and bone marrow, leaves no doubt as to the diagnosis.

References.

⁽¹⁾ E. S. Mills: "Idiopathic Aplastic Anæmia or Aleukia Hemorrhagica", *The American Journal of the Medical Sciences*, April, 1931, page 526.

⁽²⁾ Turnbull: "The Anæmias", Janet Vaughan, page 116.

SUDDEN DEATH DUE TO AIR EMBOLISM.

By IAN HAMILTON, M.B., B.S. (Adelaide),
F.R.C.S. (England), F.R.A.C.S.,

Honorary Assistant Surgeon, Adelaide Hospital.

On August 12, 1936, at the request of the Adelaide City Coroner, I made a *post mortem* investigation of the body of a young woman who had died suddenly under peculiar circumstances.

A married woman, aged thirty years, was found dead in her bed, with a sleeping child. She was in a nightgown and was lying across the bed with her legs hanging over the side. A bowl of soapy water and an enema syringe were on the floor alongside the bed. The *post mortem* findings were as follows.

The body was that of a well-nourished woman looking more than her age. *Rigor mortis* was extreme, and the lips were of a bluish colour, while the expression was peaceful. There was some blood about the vulva, and the clothing was slightly blood-stained. On opening the body the uterus was found enlarged to about a hand's breadth above the pubis. On the surface of the uterus there were noted a number of large veins filled with air; one of these was about 0.6 centimetre (a quarter of an inch) in diameter. Air could be seen in considerable quantities in the superficial vessels of the heart, and a large quantity of air within the right side of the heart could be gurgled back and forth. When the heart was opened some frothy blood and a quantity of air were found in the right auricle and ventricle. The left side of the heart was empty and the left ventricle was firmly contracted.

The uterus was then examined more fully. The cervix was softened and there was some erosion. On being opened, the uterus was found to contain a fœtus of about three and a half months' development. The membranes and placenta had been stripped up over an area about 15.0 by 12.5 centimetres (six by five inches), the placenta being fairly centrally placed in this stripped area, all of which was in the lower segment of the uterus. There were some actual tears in the placenta. Air in small bubbles was noted in the umbilical vessels. Other organs were normal.

This was a case of sudden death due to air embolism. The air had gained entry through the placental site, the placenta having been forcibly stripped off the uterine wall by an attempt made to procure abortion by an injection with an enema syringe. Probably the nozzle of the syringe fitted accurately into the cervix, and the first pump of the syringe forced a quantity of air into the uterus, as no soapy water was seen in the vagina. Death must have been very sudden; as, from the position of the body, it was surmised that the woman had just stood up and then collapsed back on the bed in syncope, not even having time to lift her legs off the floor to the bed. The circulation had ceased so rapidly that there had been practically no hæmorrhage from the stripped placental area.

Reviews.

THE ADRENALS.

MUCH still remains to be told of the story of "The Adrenals", but in his monograph of this title Professor A. Grollman has presented a comprehensive and authoritative review of existing knowledge.¹ The extent of the material dealt with may be judged from the bibliography of over seven hundred references; this is by no means complete, but excludes a large number of papers which show internal evidence of unsatisfactory experimentation or unfounded conclusions.

The author himself and his colleagues at the Johns Hopkins Hospital have made notable contributions to knowledge of the structure and function of the adrenals. They show that considerable importance must be attached to the "embryonic" or "boundary zone" which has been described from time to time under various names as occurring between the cortex and medulla. The name of androgenic zone is given to this tissue. Relations between the adrenals and the gonads have long been recognized. Grollman claims that conflicting observations have been due to failure to recognize that only the androgenic tissue is concerned in the relation, and that this tissue is not normally found in man after the first year.

¹ "The Adrenals", by A. Grollman, Ph.D., M.D.; 1936. London: Baillière, Tindall and Cox. Royal 8vo, pp. 422, with illustrations. Price: 22s. 6d. net.

A further difficulty has been the extreme rapidity with which the adrenal tissues autolyse, and the pronounced effect of this change on both structure and composition. Ox adrenals which yielded, per kilogram, after immediate freezing in liquid air, a cortical extract having a potency of 500 rat units, after being frozen for a day in the refrigerator yielded only 10 units.

The author's most important practical contribution to his subject is, no doubt, his simple method for the preparation of relatively pure extracts of the cortical hormone by adsorption on charcoal. The discussion of the difficulties of the earlier investigators is an unconscious tribute to the pioneering work of Swingle and Pfiffner and their collaborators, who with laboriously prepared, grossly impure and feebly active extracts were able to establish the existence of the cortical hormone. Up to this time attention had been concentrated upon the medulla, with its chemically simple and enormously potent adrenaline. It is one of Nature's ironies that now no physiological function of the medulla can be demonstrated, its ablation being apparently without specific effect.

Although the subject of his book is very specialized, Professor Grollman throughout it shows an admirable sense of proportion. Time and again he deplores the lack of adequate evidence upon which claims have been made for a relation between some endocrine gland and some particular tissue. Many of the facts adduced can be explained by the effect of a general disturbance of metabolism on the tissue in question. Profound general disturbance of metabolism, and of the salt and water metabolism of the body in particular, have, for example, been shown to result from cortical deficiency, but only the hypophysis has been shown to be directly affected by the deficiency.

The badly controlled experiments and loose reasoning of many of its earlier exponents led endocrinology into the morass in which, for some time, it was in grave danger of being engulfed. In the present state of knowledge, as the author points out, the only conclusive demonstration of the existence of an endocrine secretion is the occurrence of a constant and characteristic train of changes on ablation of the gland in question and the reversal of these by replacement therapy. The author's strictures on the interpretation of the effects of alleged hormones should be taken to heart by all concerned with endocrine therapy.

In the sections on the vitamin content of the adrenals the author emphasizes the caution which is necessary before concluding that a high concentration of a vitamin in a tissue indicates that the tissue elaborates the vitamin. In many cases, it is pointed out, the distribution may be explained by the partition coefficient between aqueous and lipid material, as is well shown, for example, by the fat-soluble vitamins.

Professor Grollman's book may be recommended not only as a masterly exposition of his special subject, but also as a most valuable contribution to endocrinology in general.

HEART AND ARTERIAL DISEASE.

ANYONE desirous of reviewing the modern conception of disorders of the circulatory system cannot do better than peruse "Synopsis of Diseases of the Heart and Arteries", by Herrmann.¹

All students of cardiology appreciate the original work done by this author, who is also held in high esteem as a teacher. Yet here he does not propose to present his personal views, but rather to summarize accepted modern beliefs and practices. In so doing he sifts the wheat from the chaff with a sound judgement developed from great experience. Hence advanced students and busy practitioners, for whom the book is written, will find in it a lucid exposition of practically all the useful facts found in larger volumes.

¹"Synopsis of Diseases of the Heart and Arteries", by G. R. Herrmann, M.D., Ph.D.; 1935. St. Louis: The C. V. Mosby Company; Melbourne: W. Ramsay. Demy 8vo, pp. 344, with illustrations. Price: 24s. net.

The author emphasizes the necessity in diagnosis of establishing not only the etiological factor and the anatomical lesion, but also the physiological and functional derangements, and this undoubtedly is a very sound method. He describes the pathognomonic evidence of heart disease and then goes on to explain the necessity for a detailed history and thorough clinical examination. He explains the uses of the common instruments and comments on the use of the X ray screen and the electrocardiograph.

He classifies diseases of the heart, after which he elaborates the disorders of its action and disturbances of myocardial function before studying failure of congestive and anginal types, not forgetting coronary thrombosis. It is unfortunate that this author, like most others, uses the term gallop rhythm in such a loose manner, when Bramwell's true diastolic gallop rhythm, which is so easily recognized, is a sign of such grave import. The author makes a point of the importance of disturbances of the cell chemistry which is probably one of the most pregnant fields for research. There are unfortunately a few misprints, but most of them will not mislead the careful reader.

In dealing with rheumatism, syphilis and valvular disease, the author emphasizes the fact that Mackenzie's good work in stressing the myocardial failure has obscured too much the importance of the mechanical factors of obstruction and incompetence of valves. This gives rise to the thought that their effect varies inversely with the myocardial reserve once that has diminished sufficiently.

Congenital *morbus cordis*, pericarditis and diseases of the great vessels are also explained. Remembering that the peripheral vessels are an integral part of the circulatory system, the author devotes the last chapter to peripheral vascular diseases.

We have pleasure in recommending this book as a stimulating summary of the modern concepts of the circulatory system and its disorders, in which the text is ably supported by numerous illustrations, many of them original.

GYNÆCOLOGICAL AND OBSTETRICAL TUBERCULOSIS.

PAINSTAKING investigations into tuberculosis of the organs of the female pelvis (in addition to the exceedingly extensive bibliography) have made the book entitled "Gynecological and Obstetrical Tuberculosis", by Dr. E. M. Jameson, the most comprehensive work upon this subject.¹

Tuberculosis, whether gynecological or obstetrical, usually receives brief mention at the end of chapters dealing with pathology or treatment. Jameson carefully compares and tabulates groups of patients with gynecological lesions, and he compares the tuberculous with the non-tuberculous conditions. Jameson also indicates the greater percentage of ovarian dysfunction in the former.

Age incidence, prognosis and treatment are all discussed. Many very rare lesions, for example, tuberculosis of vulva and vagina, are mentioned. It is stated that 85% of 37 married women were sterile; this percentage would appear to be high to the average gynecologist. X ray therapy is shown to be an accepted method of treatment of pelvic peritoneal tuberculosis. Jameson states that radiotherapy may precede surgery, but, on the other hand, better results appear to follow post-operative X radiation. Termination of pregnancy in the presence of active tuberculous lesions is the generally accepted practice, but in Germany patients have been found to go through pregnancy satisfactorily.

The bibliography is very comprehensive, and all phases of gynecological and obstetrical tuberculosis are dealt with. Illustrations containing numbers of photomicrographs are presented. The value of the book is largely as one of reference. It is rather too comprehensive in its survey of gynecological and obstetrical tuberculosis for most medical people to read and fully digest.

¹"Gynecological and Obstetrical Tuberculosis", by E. M. Jameson, B.S., M.D.; 1935. Philadelphia: Lea and Febiger. Royal 8vo, pp. 256, with illustrations.

The Medical Journal of Australia

SATURDAY, DECEMBER 5, 1936.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE METROPOLITAN HOSPITALS CONTRIBUTION FUND OF NEW SOUTH WALES.

THE Metropolitan Hospitals Contribution Fund was started in Sydney in July, 1932, as an association of the public hospitals of the metropolitan area. The founders of the fund recognized that something would have to be done first of all to help the hospitals to meet the continually increasing cost of treating patients, and secondly to enable patients to pay something for what was done for them, as hospital authorities expected them to do. It was obvious that many patients who were willing and even anxious to pay, and who could not pay, would welcome an organization that offered them means of insuring themselves and their dependants against hospital charges. The fund is constituted according to the provisions of the *Companies Act* and is registered under it as a non-profit-making organization. For a small weekly payment the fund offers to members of the community a form of public and private hospital insurance. Thus a contribution of sixpence a week covers the contributor, his wife and dependants; females and male minors pay

threepence per week for themselves only. In industrial, commercial and professional establishments the organization of the fund is carried out by the formation of cooperative groups of contributors; and many thousands of unattached persons are served for purposes of enrolment and payment by receiving agencies scattered throughout the metropolitan area.

The fund has been in every way successful. At the end of the first year of its existence the revenue was £31,757. The revenue for the second year was £75,302, and for the third £125,200. At the end of June, 1936, the revenue for the financial year was £175,426. During this same period the fund granted and paid claims in all hospitals in New South Wales to the value of £155,600. At June 30, 1936, the estimated membership exceeded 201,000 financial contributors; if dependants are considered, it is thought that the fund at the present time covers more than 500,000 persons. Since the inception of the fund approximately 77,500 contributors and their dependants have benefited from their membership. That readers may understand the working of the fund it may be well to explain how the revenue of the fund is distributed in satisfaction of claims made by contributors to it. In the first place, payment at the rate of six shillings a day is made for a period of eight weeks in any one year in satisfaction of claims on behalf of contributors or their dependants towards their maintenance in any private hospital or in any public hospital which is not a constituent hospital of the fund. In the second place payment is made for a period of twelve weeks in any one year in satisfaction of claims for benefit in the intermediate or private wards of a public hospital which is a constituent of the fund. The balance then remaining, subject to the creation of a reasonable reserve for a contingencies account, is distributed among the constituent public hospitals of the fund in proportion to the amount of work done for contributors or their dependants in the public wards of these institutions. During the twelve months ended June 30, 1936, the payment made to constituent hospitals of the fund in this way was six shillings and ninepence per day for each contributor treated in public wards.

It will, of course, be apparent that this fund should receive the most sympathetic and whole-hearted support of medical practitioners. That about half a million of the people in New South Wales are insured in some degree against the payment of hospital fees at times of illness is evidence of their wish to pay their way if they can. Over and over again during the last few years it has happened that contributors who in the ordinary course of events would have been treated in public hospital wards have, in virtue of their contribution to the fund, chosen to be classed as intermediate or even as private patients. This is advantageous from several points of view. In the first place the public hospitals have not had to find room for these persons in the public wards, and they have therefore been able to provide a greater number of beds for the indigent, those for whom the hospitals were originally intended. In the second place the patient has by his act of self-classification been free to choose his own medical attendant. In the third place the general practitioner has often been able to keep his own patient instead of losing him to some over-worked honorary medical officer; in these circumstances also the patient not infrequently has the advantage of continuity of treatment. A factor that will make for growth of the fund is the decision of the Executive Committee to inaugurate a further benefit scheme, by which, for an increased contribution, a contributor will be able to obtain hospital benefits of increased value. This new scheme will be of special benefit to private and intermediate patients and will without doubt meet with widespread support. The principles underlying this scheme are so sound that we have no hesitation in declaring that the intensive and complete exploitation of the idea of voluntary insurance, together with the general extension of the private and intermediate ward system in public hospitals, will go a long way towards the solution of the problem of hospital finance. If the success of contribution schemes is to be complete, there should be coordination and reciprocity between different hospitals of a State and even between schemes in different States. At present the Hospitals Commission of New South Wales is standing in the way

of reciprocity in its own State; it is not even satisfied that reciprocity is desirable. In New South Wales over one hundred country hospitals operate individual contribution schemes in which payments of varying size are made. In some of the schemes benefits at private hospitals are not obtainable. If there is no reciprocity between different funds (or if all the funds are not made part and parcel of one large fund, as indeed they should be), both patient and medical attendant may be at considerable disadvantage. The unsatisfactory position heretofore existing has to some extent been relieved by the readiness of the Metropolitan Hospitals Contribution Fund to accept country contributors irrespective of their place of residence. We are informed that the Hospitals Commission of New South Wales is taking steps to compel the Metropolitan Hospitals Contribution Fund to reverse its policy, to make it refuse further applications for membership from residents in the country, and eventually to force it to cancel the membership of existing country contributors. The Hospitals Commission is surely making a retrograde step, and one which interferes with the liberty of the patient. Those controlling the Metropolitan Hospitals Contribution Fund do not claim that it is perfect. They do, however, claim that it has done more than any other body has done to help the suffering public to help itself in the provision of hospital facilities. The Hospitals Commission would do well to reconsider a step that will not be in the public interest and that will eventually lead to its own discredit.

Current Comment.

B₁ AVITAMINOSIS.

THE whole story of the influence of vitamins on metabolism has not yet been told; and every day some fresh observation enriches our knowledge. An instance of this is the account by W. Stepp and H. Shroeder, of the University of Munich,¹ of a case in which beri-beri was produced by excessive sugar consumption and was promptly cured by vitamin B₁. The patient was a man, aged thirty-six years, father of five children, and out of work. A severe traumatic gastric hæmorrhage about a year

¹ *Münchener Medizinische Wochenschrift*, May 8, 1936.

previously had been treated with immediate blood transfusion, and he had then been put on a diet. He now returned with very severe dyspnoea and cyanosis, and gave a history of gradual loss of strength, inability to walk, and insomnia with palpitation. Previously he had been an active footballer. In the previous three to four months he had had frequent attacks of severe pain in the extremities, and especially in the calves. On examination he was cyanosed, with oedema of neck, arms and calves. The urine did not contain albumin. His systolic and diastolic blood pressure readings were 105 and 65 millimetres of mercury respectively. Water retention was pronounced. Being very thirsty, he drank three litres in the day, but passed only one litre. Strophanthin, camphor and "Coramine" produced no improvement, nor was diuresis produced by "Salyrgan" or thyroxin. Then it was found that ever since being dieted for his gastric hæmorrhage twelve months previously he had eaten from one to three pounds of sugar every day. Altogether in this time he had consumed about five hundredweights of sugar. The diagnosis of B_1 avitaminosis was now made, and he was given, intravenously, crystalline B_1 vitamin (Merck). The first injection produced a profuse diuresis. He was no longer thirsty. Oedema and dyspnoea disappeared. He slept peacefully, and in the day-time got about actively. His carbohydrate metabolism was tested by giving him 500 (*sic*) grammes of sugar, and taking half-hourly blood samples for sugar estimation. Unfortunately, he had privily taken a pound of sugar during the previous night. Consequently his "fasting" blood sugar at 8 a.m. was 283. The subsequent blood sugar figures were: 8.45 a.m., 291; 9.15 a.m., 293; 9.45 a.m., 183; 10.15 a.m., 86; 10.45 a.m., 45. At this stage he had a hypoglycæmic attack with ravenous hunger, sweating and shivering. The heavy dose of sugar evidently provoked an intense production of insulin. Animal experiments have shown that increase of carbohydrate intake intensifies beri-beri symptoms. The converse improvement by reduction of carbohydrate has also been demonstrated. The need for vitamin B_1 increases with the carbohydrate content of the diet. Quite recently it has been shown that addition of pure glucose to the ordinary grain diet of animals can produce B_1 avitaminosis. This vitamin lack depresses the internal secretions, especially of the thyroid.

In this case the upset of the water balance and the consequent oedema were the most arresting symptoms. But there were also attacks of severe pain in the extremities, and especially in the calves. In this connexion one thinks of the obstinate neuritis of *diabetes mellitus*, which also has been attributed to a deficiency of vitamin B_1 .¹ Further, a recent investigation of alcoholic polyneuritis has shown that in affected persons also the ratio of vitamin B_1 to calories in their diet may be much below the normal average. N. Joliffe, C. N. Colbert

and P. M. Joffe¹ quote Strauss as having given whisky in doses of 20 to 40 ounces a day to ten addicts with polyneuritis, together with a vitamin-rich diet. On this régime the polyneuritis improved as rapidly with alcohol as without it, and Strauss concluded that alcohol had no demonstrable toxic effect on the peripheral nerves. This investigation is referred to in a recent issue of *The British Medical Journal*.² The annotation mentions other successes with vitamin B_1 —a case of alcoholic polyneuritis treated with injections of the vitamin, a case of chronic progressive polyneuritis, and two cases of subacute combined degeneration of the cord, in one of which there was evidence of a peripheral nerve lesion. Reference is also made to a paper by G. W. Theobald that appeared in *The Lancet* of April 11, 1936, which gives details of five patients who, in the later weeks of pregnancy, suffered from "gestational neuritis"; four of the five were completely relieved by the addition of vitamin B_1 to their dietaries. Theobald had already in 1930 suggested that pregnancy neuritis might be a form of beri-beri, and stated that in Bangkok beri-beri was much more frequent in pregnant than in non-pregnant women. In the five cases described by Theobald he used "Bemax" (one ounce = 400 units of vitamin B_1) and vitamin B_1 tablets (each tablet contains 150 units), prepared by Messrs. Vitamins Limited. Another interesting paper on this subject is by Hofer von Lobenstein,³ who successfully treated with "Betaxin" (a Bayer preparation of vitamin B_1) a variety of cases of polyneuritis. These included a severe polyneuritis with paralysis, two cases of brachial plexus neuritis, two of radial nerve, two of facial nerve, one of trigeminal nerve, one of occipital nerve, one of intercostal nerve involvement, and two of sciatica. The injections were intramuscular, and caused neither pain nor other after-effects. He comments that animal experiments have shown that B_1 avitaminosis not only produces neuritis, but also damages the carbohydrate metabolism, overloading the tissues with methylglyoxal and causing an accumulation of glycogen in the liver. It also produces thyroid hypofunction and adrenal insufficiency, besides the lipid and water retention.

BROMIDE INTOXICATION.

ALMOST a century has passed since the salts of bromine were introduced into medical therapeutics. During these years the bromides have earned a just reputation as reliable sedatives in the treatment of many nervous disorders. Until the introduction of "Luminal" no agents other than the bromides won any lasting reputation in the effective treatment of epileptic seizures, and they soon proved their value in the relief of anxiety states and other mental

¹ *The American Journal of the Medical Sciences*, Volume CXCI, 1936, page 515.

² *The British Medical Journal*, July 18, 1936, page 134.

³ *Münchener medizinische Wochenschrift*, March 27, 1936.

¹ Joslin, "Treatment of Diabetes Mellitus", Fifth Edition, page 376.

disorders. In short, the bromides were held to be efficient drugs, non-habit-forming and safe. Their administration sometimes resulted in the appearance of skin rashes, it was true; but these, though annoying, were but transient and trivial. For practical purposes the bromine salts were believed to be non-toxic.

This view, that the bromides are harmless, is no longer tenable. W. D. S. Cross,¹ the latest author to publish a paper on the subject, has recently adduced evidence in proof of the contention that they can and do produce grave mental symptoms. The proper investigation of this subject had its origin, in 1925, in the elaboration of the Walter-Hauptmann test for bromides in the blood serum, and in the subsequent modification, in 1927, of that test by Wuth. The test, now widely employed in psychiatric institutions, proves that a toxic level is reached when the blood bromide reaches a concentration of 150 milligrammes in 100 cubic centimetres. This is a purely arbitrary standard, for experience has shown that symptoms of toxicosis may appear at lower levels and may be absent when the serum bromides are present in higher concentrations. Solutions of bromide salts are readily absorbed from the gastro-intestinal tract, and their appearance in the urine is a matter of minutes. Yet the kidneys excrete bromides with some difficulty. The result is that these drugs tend to pile up in the tissues and to exert a cumulative action. It is surprising, but it is true, that bromides have been discovered in a patient's urine one year after medication had ceased. In the body the bromine ion comports itself in much the same way as that of sodium. The one ion may replace the other to an extent, but that of sodium is much more readily evacuated through the kidneys. Thus in any given case in which bromides are administered a gradual heaping up of bromides may occur in the tissues at the expense of sodium ions. But the total amounts of bromides and chlorides in the tissues are constant in sum; let the chlorides rise and the bromides fall; with increased ingestion of bromides the store of chlorides sinks. In some way a delicate process of reversal occurs. If a patient taking bromides be deprived of salt, straightway bromides accumulate in his tissues. A restriction of fluid has the same result; and any disease which lessens his eliminative power, whether it be disease of the kidneys or of the heart, has a like effect.

None of us is equally susceptible to the action of bromides. We resist them, or we yield, just as we surrender to or fight against the attacks of such poisons as alcohol, mercury or lead, each in his individual way. Above all others, the psychoneurotic patient who is readily affected by emotional, toxic or physical trauma is the man in whom the effects of bromides are most readily noticeable, more especially as he is a member of a class in which bromide therapy is most widely employed. In syphilis and arteriosclerosis the increased per-

meability of the blood vessels is attended by increased susceptibility to the effects of bromides. In chronic alcoholics, most of whom eat sparingly and therefore suffer from the effects of an insufficient intakes of chlorides, the poisonous action of bromide salts, given in excess amounts, can readily be detected.

The early symptoms of bromidism are insidious and may be thought to be those of the primary condition for which they are exhibited. There is drowsiness, a slowing of movement, a retardation of all psychic processes at first; later, with continuation of the doses of bromide, the patient becomes restless and irritable; and the general upset may impel the anxious medical attendant to double the dose of the drug. Then the patient, instead of recovering, becomes sleepless, excitable and offensive. Though by day his face is expressionless, his speech thick and slow and his gait ataxic, yet at night he shouts in his hallucinations and may rise from bed to fight. In such a patient the pupils are sluggish to light and are usually dilated. There are no abdominal reflexes. Deep responses are sometimes greatly increased, while the superficial reflexes are absent. The patient is ataxic and staggers as he walks. His hands shake and he moves clumsily. Sensory changes are hard to elicit, but there may be scattered areas in which hyperæsthesia, paræsthesia and loss of feeling for pain and touch are noticed. The patients in general are pale, with mask-like faces. They eat little, they have dirty tongues and foul breath, and their bowels move infrequently. The skin rashes so much advertised as tokens of bromidism are absent more often than present.

The diagnosis of bromidism must be borne in mind whenever, in any patient under treatment for mental disorder, there is confusion or clouding of consciousness, especially if these things are of recent onset and associated with the taking of "salty" medicine. The wide range and inconstancy of reflex signs are sufficient grounds for suspecting a toxic state of some sort; and these, together with the dry tongue, the foul breath, the thick speech, the ataxia and the expressionless face, are confirmatory signs. The simple test of Wuth, in which animal charcoal and trichloroacetic acid are the reagents, will determine whether bromides are present in the patient's urine. If this test gives a positive result, it becomes necessary to estimate the bromide content of ten cubic centimetres of blood, using the Walter-Hauptmann method, in which the serum is treated with trichloroacetic acid and gold chloride solutions and is later compared with standard samples of sodium bromide of known strength.

The best treatment for bromidism is the administration of sodium chloride. Thirty grains of this may be given three or four times daily in a sweetened mixture. Intensive methods of saline administration, for example, by the intravenous route, have the disadvantage that they may flood the circulation with a sudden rush of bromides. But the chloride may be given *per rectum*, and throughout the treatment a liquid diet and foods of

¹ The Canadian Medical Association Journal, September, 1936.

high caloric value are required. To quieten delirious or maniacal patients sedatives may be necessary, though the administration of such drugs to already toxic subjects is a matter for serious consideration. And even barbitone, paraldehyde, morphine and hyoscine are of little effect in patients who suffer badly from hallucinations. Under constant treatment with sodium chloride little improvement can be expected in less than three weeks, and the patient may still be irritable and emotional for a month or more.

Little more than a year ago Craven reported a series of cases of bromide poisoning in normal persons. He stated that bromide toxicosis might be produced by overdosage in such people, and not only in patients whose psychiatric make-up rendered them liable to the intoxication. To the latter category belong habitual drug addicts and alcoholics. Craven found sedatives useless in the treatment of his patients and confined himself to the giving of large doses of sodium chloride by mouth. He considers that the signs and symptoms of bromide intoxication occur with sufficient regularity to constitute a clinical syndrome. Any comment upon this matter by those engaged in mental hospital practice would be of the greatest interest.

THE EFFECT OF SOLAR RADIATION ON ANIMALS.

In Australia considerable interest has been taken in the physical effects of sunlight. Natives of this country are apt to be scornful of the carefully measured and eagerly sought hours of sunlight in Britain, and perhaps because of their very familiarity with bright sunshine have in some instances suffered because of their consequent contempt of so powerful an agent. Skin cancers seem definitely to be associated with undue exposure to the sun's rays in certain cases, and physicians interested in pulmonary disease usually caution their patients with active tuberculosis of the lungs not to expose their bodies rashly to the sun. The risk of activation of pulmonary tuberculosis by this means is believed by most physicians to be a real one, even though they may find it hard to furnish convincing proof. Of course, what occurs in an animal under given conditions is no index of what may happen to a human subject in comparable circumstances, but it may be news to many to learn that guinea-pigs may be killed by exposure to sunlight. M. Pinner and A. E. Margulis have investigated this phenomenon from a strictly experimental point of view.¹ They point out that for a number of years it has been known that mammals, particularly rodents, sometimes died after exposure to the sun for a comparatively short period of time; but they state that accurate measurements of the radiant energy and exact pathological observations have been lacking from previous experiments. In

their own work they used the guinea-pig because they found accidentally that this animal was sensitive to radiant energy, and then discovered that one hour's exposure to the midday sun at Tucson, Arizona, whose elevation is 2,600 feet above sea level, was sufficient to cause death. The radiation was applied to the shaved ventral surfaces of the animals by a constant technique, a siderostat being used under standard conditions; and the amount of energy thus employed was measured by a thermocouple. Variation in the incident energy could be produced by movement of the animal in the path of the focused beam, and the interposition of suitable filters permitted different portions of the solar spectrum to be used. The minimal power thus employed in a concentrated beam was calculated as being equivalent to the unconcentrated solar radiation at the site of the experiment, and corrections were made for reflection from the body surface. It will be seen that all care was taken to carry out this work under controlled conditions. It was found that the particular fraction of the spectrum employed did not alter the result appreciably, nor was there any significant variation in the pathological findings. Death occurred in about one hour; the respiration rate rose in about ten minutes after exposure, and later gross respiratory incoordination was noted with hyperpyrexia. At autopsy the exposed parts of the skin were covered by petechiae and the connective tissues were oedematous; the lungs showed areas of massive congestion, and the liver, spleen and intestines were also very congested. Histological studies confirmed the presence of peripheral vascular paralysis and exudation.

The guinea-pig is an animal with a very thin skin, practically devoid of sweat glands, and apparently is very susceptible to solar radiation, a characteristic of other rodents also; it also has a normally high respiration rate, but it does seem strange, as the authors remark, that its capacity for adaptation in this regard is so limited. Man's compensatory mechanism is very much more efficient of course, nor can we compare the effects of the sun's rays on one small rodent with those which may occur in man. But such exact experiments are important in that they lay emphasis upon the extraordinary potency of radiant energy of the sun to which we often lightly expose ourselves. Quite apart from the possible effects of actual tissue destruction, as in severe sunburn, or of sunstroke, there are potentialities of harm in excessive doses of sunlight, varying from the fatigue and malaise of the pale, tired child thoughtlessly soaked in sunlight on the first day or two of a seaside holiday, to the flaring up of a pulmonary lesion in a person with active tuberculosis. The beneficent effect of sunlight is of course obvious, but, like all powerful remedies, its dose should be controlled when it is ordered as a therapeutic measure. Perhaps it is not out of place to point out that Australians may sometimes be included in the refrain of a popular, if frivolous, song which declared that "Mad dogs and Englishmen go out in the noon-day sun".

¹ *Annals of Internal Medicine*, August, 1936.

Abstracts from Current Medical Literature.

MEDICINE.

Jaundice.

M. BRULÉ AND J. COTTET (*La Presse Médicale*, November 2, 1935) discuss the diagnosis between obstructive jaundice and jaundice due to hepatitis in catarrhal jaundice and infective jaundice. In obstructive jaundice the liver is engorged and becomes large and tender on deep palpation, resembling the cardiac liver. In hypertrophic cirrhosis the liver is large and hard, with a clear-cut edge, whereas in catarrhal and infective jaundice the liver approximates to normal size. In the early stages of hepatitis, especially in catarrhal jaundice, the excretion of galactose in the urine after ingestion of a measured dose is increased to "20 up to 70 per 1,000" in the first specimen of urine passed, "10 to 20 per 1,000" in the second specimen, still less in the third, and none in the fourth specimen. Early in obstructive jaundice barely "6 per 1,000" were present in the urine in the first two hours, and little or none in the second, third and fourth specimens, which is approximately the normal excretion. These were the results obtained by Bauer's method. In the later stages of jaundice this method of differentiation is less certain, but if the test is repeated it will be found that the galactose excretion improves in catarrhal jaundice and grows steadily worse in obstructive jaundice. In hemolytic icterus, after ingestion of 600 cubic centimetres of water, the excretion of urine rises from 37 cubic centimetres in the first hour to 320 cubic centimetres between the seventh and ninth hours, and then remains constant at 100 cubic centimetres for the remaining fifteen hours of the twenty-four. The specific gravity falls to 1005 in the first two hours and rises to 1015 in the seventh hour; this is a normal response. In catarrhal jaundice, during the first few days the urine excretion remains at about 30 to 40 cubic centimetres per hour throughout and the specific gravity at 1018 to 1025; there is no diuresis after ingestion of 600 cubic centimetres of water. Later the specific gravity recedes to 1012, and by the eighth to the fifteenth day the excretion and specific gravity return to normal. In obstructive jaundice due to cancer of the pancreas or stone, urinary excretion is normal at the onset of icterus and grows steadily worse. Normally the bilirubinemia is sixteen milligrammes and cholemia nil. In all jaundice bilirubinemia increases more than cholemia. In catarrhal jaundice bilirubin is retained, while bile salts begin to pass into the intestine (permitting the absorption of fats) and disappear from the urine.

In obstruction the pigments and salts increase steadily in the blood; bilirubin rises from 0.016 gramme (the normal figure) to 1.500 grammes or even 2.0 grammes; the bile salts rise from 0.030 to 0.140 gramme, being about eight to ten times less concentrated than the bile pigments. These high figures remain throughout. In catarrhal jaundice, however, though the bile salts and pigments increase in the blood, about the twenty-second day the bile salts rapidly diminish.

Alcohol and Digestion.

H. BLOTNER (*The Journal of the American Medical Association*, June 6, 1936) discusses the effect of alcohol on digestion by gastric juice, trypsin and pancreatin. First the author investigated the gastric juice of non-alcoholic patients to determine its power *in vitro* of digesting egg albumen. The digestion was most marked in those specimens in which the hydrochloric acid content was high, and least when it was low. Similar results were obtained with trypsin and pancreatin. The addition of alcohol prevented the occurrence of any digestion of albumen whatever. Gastric juice of eight alcoholic subjects was then tested; these subjects drank a pint or two of whisky a day for ten days beforehand. This gastric juice was free from hydrochloric acid, and on testing with it no digestion of albumen occurred. When hydrochloric acid was added to this gastric juice, still there was no appearance of digestion. It appears that a sufficient amount of alcohol inhibits the proteolytic activity of certain gastro-intestinal enzymes and this prevents proper assimilation of food; consequently a deficiency disease is produced, of which alcoholic neuritis may be one sign.

Ætiology of Lymphadenoma.

M. H. GORDON (*The Lancet*, July 11, 1936) discusses the recent work in connexion with the ætiology of Hodgkin's disease. There is no doubt that the condition is the reaction of the human body to some specific pathogenic agent. Prolonged laboratory investigation has indicated, first by a process of exclusion, secondly by positive microscopic findings, and more recently by direct clinical observation, that the causal agent in question is represented by the very minute spherical or oval elementary bodies (E.B.'s) that occur in vast numbers and apparently in pure culture in the affected lymph glands, especially during the acute stage. In general appearance, size and morphology these "Hodgkin bodies" bear a close resemblance to the well-known "E.B.'s" of Paschen that have now been proved to be the virus of vaccinia. In a number of other virus diseases also similar "E.B.'s" occur and constitute in all probability the

exciting agents. Investigation of fresh specimens of serum from cases of lymphadenoma for the presence of flocculating antibodies to a suspension of "E.B.'s" obtained from lymphadenoma glands, has given what appear to be positive results in a proportion of cases, the control sera and antigens being "negative". In the experience of the author, the reaction has not been consistent or strong enough to be useful for the purposes of diagnosis until the technique of carrying out the tests has been improved. Therapeutic trial of vaccines of the "E.B.'s" separated from the patient's own glands has provided important confirmatory evidence of their ætiological rôle, since it has revealed that, when attenuated in various ways and administered subcutaneously in the form of a vaccine, lymphadenoma patients in whom the disease is progressing are hypersensitive to them. As a similar state of hypersensitivity to a comparably small dose of vaccine of the infecting microorganism occurs in the acute stage of infections of the ordinary pathogenic bacteria, this hypersensitivity of the lymphadenoma patient to a suspension of the "E.B.'s" from his own gland is highly significant. Details are given of the method of preparation of a sensitized vaccine. The clinical results following the use of a homologous sensitized vaccine are looked forward to with not a little interest, both from the therapeutic and ætiological viewpoints.

After-Care in Pulmonary Tuberculosis.

PENDRILL VARRIER-JONES (*Tubercle*, September, 1936) criticizes the after-care of the tuberculous as carried on at present in England. This consists, he asserts, of a system of care committees lacking funds, who attempt to induce employers to employ discharged sanatorium patients. When these attempts fail—a frequent occurrence—the patients are sent to handicraft classes, where they can earn "pocket money", or they may be given extra nourishment. But there is nothing permanent. As the main object in the life of the consumptive is to return to work, he will get away from sanatorium and clinical treatment as soon as he can and will seek employment on his own account; after-care will not interest him. The author insists that vital economic factors are being neglected, and particularly urges workers in the field of after-care to remember that "life without purpose is life without value". The village settlement, as exemplified by Papworth, gives full recognition to this fact. It provides to a proportion of the tuberculous permanent after-care, and thus a purpose in life. Two hundred and thirty consumptives are employed there permanently. The only important criticism directed against the settlement is that such a small proportion of the tuberculous

is provided for that it is no solution of the problem. To this the author retorts that the obstacle which limits the percentage is the non-medical one of finance. It is necessary, he maintains, that the State shall support after-care and realize that it is an essential part of treatment and is as important a factor in the tuberculosis problem as any clinical measures.

Acute Laryngo-Tracheo-Bronchitis.

CHEVALIER JACKSON AND C. L. JACKSON (*The Journal of the American Medical Association*, September 19, 1936) record observations on acute tracheo-bronchitis in children. The condition is almost specific; it is not due to diphtheria; in some cases it is influenzal. Pneumonia or bronchopneumonia is usually diagnosed in fatal cases. Autopsy records are few. Bronchoscopically it is seen that the laryngeal mucosa is deep red; the subglottic tissues are red and swollen; there is loose secretion and no ulceration. The tracheal mucosa is reddened and later swollen and covered with serous then mucoid exudate, tenacious and exceedingly difficult to expectorate even by robust adults. The bronchi or trachea may be occluded by swelling and oedema of the mucosa. Straw-coloured or brownish crusts have been noted in the trachea and bronchi. This condition is contrasted with diphtheria in which the bronchoscope reveals extensive adherent membrane. In *laryngismus stridulus* or spasmodic croup the mucosa is of a lavender or violet hue, but otherwise normal. In severe cases there is a glottic spasm. In most cases the glottic closure relaxes, but if this does not occur a small bronchoscope should be introduced to start the child's breathing by insufflation of oxygen and carbon dioxide, combined with artificial respiration. When respiration is established the bronchoscope is withdrawn. The cause of *laryngismus stridulus* is a sudden violent inspiration started by the entrance of secretions into the larynx. The streptococci are the main cause of laryngo-tracheo-bronchitis. The mortality in children under three years of age was 70%. In this condition atropine and opium are contraindicated. The dry superheated air of American hospitals is dangerous; the air should be saturated with moisture. An impaired percussion note and increased respiratory rate usually indicate atelectasis, not pneumonia. Peroral or bronchoscopic aspiration of secretions is indicated and removal of crusts with forceps may be necessary.

Intestinal Stricture and Anæmia.

J. C. HAWKLEY AND E. MEULEN-GRACHT (*The Lancet*, July 18, 1936) report a further case of intestinal stricture with pernicious anæmia and discuss the pathogenic connexion between the two conditions. In the

case recorded there was an old tuberculous enteritis followed by healing and the production of strictures. The strictures may produce disturbance of gastro-intestinal function in two ways: by impairment of intestinal absorption or by progressive gastritis, atrophy and failure of the stomach to secrete the intrinsic factor. If the strictures are resected or short-circuited in time, recovery of gastric and intestinal function takes place. If operation fails to cure the anæmia, treatment with liver or stomach preparations will effect a cure so long as intestinal absorption has not been interfered with. It is likely that in the majority of cases of stricture anæmia the anæmia depends upon the balance of two factors that vary from case to case, one being the absence of gastric secretion and the other a diminished power of intestinal absorption; in a few it may be possible to claim that one factor alone is at work. Strictures from other causes and partial obstruction lasting over a long period of time may occasionally produce the symptom complex outlined. It is also known that the resection of extensive lengths of small intestine may result in the development of pernicious anæmia.

Symptoms of Appendicitis in Acute Infectious Diseases.

G. W. RONALDSON (*The British Journal of Children's Diseases*, April-June, 1936) draws attention to the mention of appendicitis as a complication of a number of the acute infectious diseases, some French writers attaching considerable importance to its supposed relationship to scarlet fever. In a five-year period at a large London infectious diseases hospital, where 20,000 patients were under treatment during the period, there were only two appendicectomies. It is a well-recognized fact that abdominal conditions in young subjects may pursue an insidious course and may occasion diagnostic difficulty. In scarlet fever it would appear that while lymphoid tissue in other situations, such as the tonsil, is often the site of a suppurative process, the appendix seems to enjoy a high degree of immunity from the septic manifestations of the disease. Many writers have described enlargement of the lymphoid areas of the intestinal tract as a prominent morbid appearance in scarlet fever; but none of them goes further than to state that this lymphoid involvement offers a probable explanation of the slight but transient iliac discomfort that may be met in the initial phase of the disease. This localized pain in the iliac region may be a feature of the prodromal stage in measles. This condition is important and deserving of wider recognition than it has hitherto received. Gröer states that "several times we have observed typical appendicular symptoms in the initial stage of measles which caused the attending physician to send the patient to the surgical

unit". The records of appendicectomy in measles emphasize the importance of a routine examination of the buccal mucous membrane in young subjects; for the discovery of Koplik's spots will establish the diagnosis and obviate too hasty interference. Symptoms suggesting appendicitis may occasion particular diagnostic difficulty in enteric fever. The pain in the iliac region is seldom so acute in enteric fever or so localized at McBurney's point as in appendicitis. A due evaluation of such considerations as pulse rate and blood count may also materially assist in the diagnosis. The author considers that though the possibility of the occurrence of abdominal symptoms in the acute exanthemata must be kept in mind, his own experience lends no support to the contention that such symptoms are really common.

The Effect of Early Tonsillectomy on the Incidence of Acute Rheumatism.

H. L. WALLACE AND A. BROWNIE SMITH (*Edinburgh Medical Journal*, July, 1936) review a series of cases in which tonsillectomy has been performed in an endeavour to discover any relationship to the onset of rheumatic infection. The authors review the recent literature. In 1927 the Ministry of Health reported that great benefit was being obtained from early tonsillectomy and considered operation an effectual preventive of recurrence. Many authors have doubted its value as a prophylactic of rheumatic heart disease. Kaiser, in 1934, found that rheumatic infection occurred slightly more frequently in children whose tonsils had not been removed. The authors carried out an investigation to determine whether tonsillectomy in early childhood had any appreciable effect on the incidence of subsequent acute rheumatic infection in the children concerned. Rheumatic infections are rare before five years of age. After much trouble the authors traced 403 patients who were approximately at the age for leaving school. A control series was also investigated, the members of which had had tonsils removed in the later years of childhood. In the group whose tonsils were removed before the age of five years, there were 235 males and 168 females. The sex ratio is quite different from that of the incidence of acute rheumatism. In intervening years 7.2% of the patients had suffered from acute rheumatic manifestations. The authors found that removal of tonsils in early life failed to reduce the incidence of rheumatic infection. In the control group, comprising those whose tonsils were removed in the later years of childhood, only 4.2% showed acute rheumatic disease. During the course of investigation inquiry was made concerning the incidence of scarlet fever. The authors found that tonsillectomy played no part in prophylaxis.

British Medical Association News.

SCIENTIFIC.

A MEETING of the South Australian Branch of the British Medical Association was held on September 26, 1936, at Clare, South Australia. Dr. ALFRED STOKES, the President, in the chair.

Infections of the Upper Respiratory Tract.

Dr. H. M. JAY read a paper entitled "Infections of the Upper Respiratory Tract in Children" (see page 774).

Dr. R. L. THOROLD GRANT also read a paper entitled "Infections of the Upper Respiratory Tract in Children" (see page 776).

Dr. A. R. SOUTHWOOD, in opening the discussion, complimented the readers of the papers on the excellent review of the subject they had placed before members. Dr. Grant had no need to apologize for the brevity of his paper, for in it he had given a well-balanced and comprehensive summary from the standpoint of the physician.

Infections of the upper portion of the respiratory tract had a very large place in the illnesses of childhood. The severe general symptoms of acute naso-pharyngeal infection in a child often made the physician suspect pneumonia as the basis of the illness, yet only occasionally in such cases did definite evidence of consolidation become manifest. Absorption of toxins from the upper respiratory tract was able to reproduce just as severe general symptoms as those occurring in pneumonia.

Dr. Grant was wise in emphasizing the menace of the "negative swab". Surely there were few practitioners in these days who failed to administer serum on the least suspicion of diphtheria. Swabbing was certainly a menace if any reliance was placed upon its results for guidance in treatment. What looked like diphtheria should be treated as diphtheria.

Dr. Southwood agreed with Dr. Grant as to the rarity in South Australia of bronchiectasis in adults. Was it probable that those children who suffered much from infections of the upper respiratory tract were in later life more liable to pulmonary tuberculosis? Chronic mouth breathing certainly appeared to be a factor in tuberculosis. The association of malocclusion, mouth breathing and nasal obstruction constituted a vicious circle. A condition of general physical and mental asthenia was often a striking accompaniment. Relief of the naso-pharyngeal obstruction usually allowed the mouth-breathing habit to be corrected, and prompt improvement in general health almost invariably followed. The occurrence of marginal gingivitis in the upper incisor region in mouth breathers was referred to by Dr. Southwood.

Apart from the desirability of everybody having an ample, well-balanced diet, with a good supply of fruit, vegetables and milk, Dr. Southwood thought the effects of special dieting in protecting children against naso-pharyngeal infections was doubtful. Practitioners and the general public should guard against "food fads". Knowledge of nutrition needed extending before one could profitably prescribe clear-cut and fixed diets for all classes of sick people. Reliance should be placed on general principles rather than on precise details. From the scientific standpoint the value of calcium treatment in combating infections also seemed doubtful, although many able clinicians had found calcium administration useful in some illnesses. The investigations of such workers as Sheldon and McCance would doubtless lead to a clearer understanding of the various aspects of calcium metabolism and provide a more secure basis for rational treatment.

Dr. A. STOKES remarked that Dr. Jay had said that in a certain number of cases mouth breathing continued after removal of tonsils and adenoids, in spite of the fact that there was no malocclusion of jaws. In his opinion, the continuation of mouth breathing was due to the fact that

the children had been breathing through their mouths for several years and had formed a bad habit; unless they were given proper breathing exercises and corrective apparatus, such as a bridge, they would continue to do so. The fault was not due to failure of the operation, but to lack of after-supervision.

With regard to acute and chronic nasal catarrh, Dr. Stokes had recently used "Metaphen Inhalent No. 99" (Abbott's Laboratories) and found it most satisfactory, an acute condition being relieved almost at once and cured in twenty-four hours; it also gave great relief in chronic cases.

Dr. P. T. S. CHERRY thanked both Dr. Grant and Dr. Jay for their interesting papers. He asked Dr. Grant if, in the second case he quoted about post-diphtheritic paralysis, a positive swab had ever been obtained. Dr. Cherry cited one death which was apparently due to clinical laryngeal diphtheria, recorded, in the absence of a positive swab, as caused by laryngeal obstruction due to *Staphylococcus aureus*. In this case, however, there was a positive diphtheria swab in another member of the same family a few days after.

Dr. Cherry was interested in Dr. Jay's allergy theory, and asked whether, in his opinion, the new-fashioned cereals, such as "Granose" *et cetera*, were responsible. In his practice at Port Adelaide it was frequently observed that the incidence of "hives" in children was more common among consumers of these types of cereals.

It was a well-understood circumstance that diphtheria carriers and convalescent cases that did not clear up had enlarged tonsils and adenoids, and that removal of these usually remedied the infective condition. However, he would like to know if Dr. Jay could enlighten him as to why nasal diphtheria was so chronic in its convalescence. He wondered whether the bacillus lurked in the antra and sinuses, and, if so, what was the remedy.

Dr. Cherry stated that the use of babies' dummies was almost universal, even in doctors' families. He did not think they encouraged mouth breathing—in fact, the opposite. The baby's lips round a soother made him breathe through his nose. This was shown conversely when an infant had a cold, with his nose "stuffed"; it was then difficult for him to take the breast. With his lips tightly round the nipple the child could not breathe, proving that he breathed through his nose when sucking naturally or with a dummy.

Dr. D. G. MCKAY said that during mild outbreaks of diphtheria in the Adelaide Children's Hospital recently they had proved the fallacy of a single swab for contacts. They now insisted on three "negative" swabs from inmates of a ward before they considered the ward free from infection.

Peritonsillar abscess had been mentioned as a rare condition in childhood, but a condition which might be confused with it was a parapharyngeal abscess. It was important to distinguish between them, as the latter was a much more serious condition. They had had several cases during the last few years; one patient died suddenly by ulceration of the abscess into the big blood vessels of the neck. In parapharyngeal abscess the tonsil on the affected side was pushed forwards, there was usually no oedema of the uvula, and pain was not such a prominent feature as with peritonsillar abscess.

Dr. McKay asked whether nose-blowing was as dangerous as some recent articles would lead them to believe. In some of the big boarding schools in England nose drill was carried out every evening before retiring. Much vigorous blowing of the nose was indulged in, and it was considered that this definitely diminished the incidence of upper respiratory infections.

Referring to diet in sinusitis, Dr. McKay said that, seeing that the hospital class provided the major portion of the cases of sinusitis, one was forced to the conclusion that diet played a very definite part in its incidence. Dr. Jay had given a diet which he prescribed for such cases, and in it he cut the carbohydrates down to a minimum. This was interesting in view of the fact that a year or so ago an article appeared in THE MEDICAL JOURNAL OF AUSTRALIA on sinusitis in children, in which the author

was able to show considerable improvement by giving large amounts of glucose.

DR. E. F. GARTRELL pointed out that the excellent discussion reflected credit not only on the papers presented, but also on the choice of subject, and he would like to congratulate the speakers. There was one aspect of sore throat to which Dr. Grant had alluded, but which had not been amplified in the discussion, namely, the relationship between that condition and affections of the heart. There was ample evidence to show that some sore throats fell into the same category as rheumatic infections, and, following some of these attacks, cardiac damage of a rheumatic nature had obtained.

The American Heart Association, which had done such good work in standardizing criteria in diseases of the cardio-vascular system, had sponsored observation on rheumatic colonies. Here it had been found that whereas some infections, such as influenza, had had no effect in lighting up the old rheumatic lesions, others, such as sore throats due to certain hemolytic streptococci, had definitely lit them up. As had been pointed out, it was extremely probable that some of these infections of the upper air passages, as well as the so-called rheumatic infections, were really of an allergic nature.

A practical point of importance was that of taking care to graduate the exertion of any patient who had been in bed suffering from sore throat, if there was any suspicion of cardiac involvement. This, of course, was of paramount importance in the case of diphtheria.

DR. D. L. BARLOW supported Dr. Jay's observation of the frequency with which it could be discovered that patient's suffering from sinus trouble were allergic. Whereas this was formerly often a matter of opinion based on the history and the appearance of the nasal mucosa, it could now usually be demonstrated by sensitization tests. The causative agents were usually animal danders, feathers, household and factory dusts. It was important after any necessary surgical procedure in these cases to discover any allergic irritant and to eliminate it from the environment if possible, and sometimes to undertake desensitization. The prevalence of allergic conditions affecting the respiratory system did not appear to be recognized by medical men in general; this applied more to the chronic and non-seasonal manifestations. An allergic rhinorrhoea could easily be mistaken for an infective "cold". A useful method of differentiation was to make a smear from the discharge and to examine for the presence of eosinophile cells. In allergic states these were generally numerous. Dr. Barlow congratulated Dr. Grant and Dr. Jay on their excellent and very practical papers.

A MEETING of the New South Wales Branch of the British Medical Association was held in the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, on September 24, 1936. DR. E. H. M. STEPHEN, the President, in the chair.

Streptococcal Infections.

DR. ARCHIE ASPINALL read a paper entitled "Streptococcal Infections" (see page 778).

PROFESSOR H. K. WARD said that in discussing streptococcal infections it was necessary at the outset to say a few words about the classification of the streptococci. Save for infective endocarditis and certain infections by anaerobic streptococci, which occurred under special conditions, there was no good evidence that disease could be caused by any but the hemolytic streptococci. It was true that the green streptococci had been claimed from time to time as the cause of many diseases—measles, poliomyelitis, epidemic influenza, cholecystitis, acute rheumatic fever, chronic rheumatism, colitis, arthritis, encephalitis, *myasthenia gravis et cetera*, but the evidence was far from convincing, if only for the lack of proper controls. It was apparently not properly realized that green streptococci were present in enormous numbers and varieties in the mouth, throat, tonsils, stomach and colon of all

individuals; so that their mere isolation from any of these regions could have no significance. The fact that certain of these green streptococci could survive incubation in normal blood was interesting—the so-called pathogen-selective method of Solis-Cohen—but obviously very far from proof that they were causally connected with disease processes.

With regard to infections by the hemolytic streptococci, it was now clear that these organisms had two distinct pathogenic actions. In the first place they secreted a soluble exotoxin like the diphtheria bacillus, this toxin exerting a general toxic action on the body; and in the second place these organisms, unlike the diphtheria bacillus, had a marked capacity for spreading and invading the tissues of the body, and this power of invasion was more to be feared than the toxic action. Uncomplicated scarlet fever was the clinical picture produced by the exotoxin. Why was scarlet fever such a mild disease nowadays? It was possible that the invasive capacity was in abeyance and that the high mortality of the older epidemics was associated with streptococcal bacteremia. Some support for this view was lent by other streptococcal diseases. It was known that in cellulitis, puerperal sepsis, mastoiditis and erysipelas the prognosis was good so long as the blood stream remained sterile, but that the chance of recovery was no better than even if the blood culture was positive. This was the reason why no attention should be paid to therapeutic claims unless the blood culture was known to be positive.

In the treatment of these diseases antitoxin was generally considered to be a valuable aid if the toxic symptoms of scarlet fever were severe; there was no good evidence, however, that it prevented the complications of scarlet fever or that it was of value in streptococcal bacteremia. The only known method by which the body was capable of combating invading hemolytic streptococci was by phagocytosis. Phagocytosis was, however, dependent on the presence of opsonin specific for the particular invading organism. A logical treatment would therefore be the injection of an antiserum containing the necessary specific opsonin. Unfortunately, the difficulties of such a procedure had so far proved insuperable. Even were it possible to type the hemolytic streptococci quickly and easily, as was possible in the case of the pneumococci, it was far from easy to produce effective opsonizing antisera in animals. The product labelled "polyvalent anti-streptococcal serum" was in all probability valueless. It was not tested, for the very simple reason that there was no method of doing so. From time to time drugs had been tried in these infections, and a preliminary report about a recent Bayer product, "Prontosil", had been encouraging.

If no definite progress could be signalled in the therapy of streptococcal bacteremia, the source of these infections was becoming more generally recognized and attention was being directed towards prevention. It had been shown that the normal habitat of virulent hemolytic streptococci was the human throat, and that it was droplet infection that had particularly to be guarded against. Hemolytic streptococci did not survive long on clean skin, and if reasonable care was taken in washing the hands, it was unlikely that infections would be carried from one patient to another in this way. The dangerous people were those carrying hemolytic streptococci in their throats, and they should not be allowed in the operating theatre, in the delivery room, or in the nursery of a lying-in hospital; for very young infants were very susceptible to streptococcal bronchopneumonia. How were these carriers to be detected? Periodical routine throat swabs were the ideal method, but if these were impracticable, the risk could be minimized by insisting on the use of efficient masks, and above all by impressing on all ranks the necessity of reporting any sore throat or sinus trouble at once. Puerperal sepsis was largely a preventable disease, and the incidence could be greatly reduced if the members of the profession were as concerned about droplet infection as they were about infection from hands and instruments.

DR. H. A. RIDLER referred to pus tubes and puerperal sepsis. He said that in the two women's hospitals in

Sydney most cases of pus tubes seen were due to the streptococcus; then came the gonococcus, and after that a number of other organisms. Woe betide the poor unfortunate patient who had pus tubes due to the streptococcus if she was operated on in the acute or subacute stage of the infection. She would die, and within forty-eight hours, however brilliant the operator. In speaking of operation, Dr. Riddler did not refer to posterior colpotomy, which was a legitimate procedure.

Dr. Riddler said that puerperal sepsis was generally due to the streptococcus. A great deal had been said of late about droplet infection, the danger of which was being overrated. It had been known for a long time that any doctor or nurse suffering from a sore throat was a danger to anyone with whom they came in contact, whether the person was pregnant or non-pregnant. Also there were certain elementary rules about coughing and sneezing which were not exclusively obstetrical.

Dr. P. L. HIPSLEY said that there were one or two things mentioned by Dr. Aspinall with which most of those present would not agree; for example, the treatment of streptococcal empyema. Dr. Aspinall had said that early operation rather than aspiration was the best treatment. Dr. Hipsley thought that it was now generally agreed that aspiration should be performed on several occasions and then open operation.

Dr. Hipsley said that he had recently encountered a case of spreading post-operative gangrene. From a study of the literature he concluded that the cause was not understood; but none of the authors that he had consulted mentioned the streptococcus as a cause. Streptococci and staphylococci occurred together. There was no doubt, however, as to the treatment. The lesion should be excised early with an electric cautery knife. If the condition was allowed to progress for months the patient would die.

Dr. Hipsley thought that droplet infection was certainly the cause of puerperal sepsis in many cases. It was now the rule at the Royal Hospital for Women for all attendants to be masked. But Dr. Hipsley thought that most masks were inefficient; he considered that six layers of gauze were necessary. During the influenza epidemic, if one wore a few pieces of gauze he was considered to be efficiently masked. At that period all the doctors who were masked efficiently escaped infection.

Dr. Hipsley thought that the nephritis of scarlet fever occurred from the nineteenth to the twentieth day; he did not think it ever occurred as early as the tenth. The adenitis following infection of the throat, mentioned by Dr. Aspinall, reminded him of the adenitis which sometimes followed scarlet fever. Many cases he had encountered began with a sore throat and a rash, which disappeared in a week. The patients then seemed well; but then their cervical glands enlarged. Dr. Hipsley wondered if Dr. Aspinall's patients with enlarged cervical glands had had scarlet fever without the rash.

Dr. A. H. TEBBUTT said that he was glad to have heard Professor Ward's remarks. Professor Ward had done a service in knocking on the head some fancies concerning streptococcal infections. The pathogen-selective culture method had wanted knocking on the head. Dr. Tebbutt thought that at a meeting of the Branch some years previously he had been almost alone in opposing the hypothesis put forward in this connexion. It was a useful method in the isolation of streptococci; but it meant nothing.

Dr. Tebbutt agreed with Professor Ward that the hæmolytic streptococcus was of prime importance; but he would not go so far as to say that *Streptococcus viridans* was non-pathogenic excepting in endocarditis. The mere fact that it caused endocarditis was proof of its pathogenicity. Dr. Tebbutt had observed the green streptococcus in other conditions in which he believed it to be pathogenic, particularly in and about the respiratory tract, and had isolated it from the blood stream when endocarditis was not proved to be present.

Dr. Tebbutt said that Professor Ward had seemed doubtful of the efficacy of serum therapy in streptococcal infections. But good results had been reported, especially after the use of scarlet fever antitoxin. Dr. Tebbutt himself had seen what appeared to be very favourable results, but

it seemed of little use to quote cases. After all, people still died of diphtheria, even when they were given antitoxin in large doses. The only satisfactory experiment of treating diphtheria with and without antitoxin was that reported in 1898 by Fibiger. Patients on alternate days were given antitoxin. The mortality was 12.25% in those not given antitoxin, and 3.5% in those given it. The mortality from tetanus was still very high, although this was a toxæmia, and the antitoxin was often administered in enormous doses. It was always worth while investigating septicæmias bacteriologically, and personally he advocated specific serum therapy according to the bacteriological findings. He employed large doses intravenously and as early as possible. The results might be controlled by blood culture. He thought that in scarlet fever antitoxin we had a valuable concentrated serum. He admitted the difficulties put forward by Professor Ward.

Dr. A. J. GIBSON thanked Professor Ward for his remarks and said that his help was greatly appreciated at the Women's Hospital in the elucidation of streptococcal infections. It was generally recognized that in puerperal sepsis there were two main varieties of infection. There was the type that started with a high temperature on the second day after a normal delivery; this condition was then probably a streptococcal one due to droplet infection. Such cases were difficult to deal with. Recently a new preparation, "Prontosil", had been advocated, and several good results had been reported. Dr. Gibson had had two patients admitted under his care at the Women's Hospital recently with high temperatures and signs of peritonitis on admission. The infection in both started on the second day after an easy delivery. Puerperal peritonitis was an insidious condition and was often not diagnosed in the early stages. With the syndrome of abdominal distension, pain in the lower part of the abdomen and diarrhoea, peritonitis should be suspected. Many authorities held that the best treatment for these patients lay in early incision and drainage. One of the patients mentioned by Dr. Gibson had this syndrome and hæmolytic streptococci were isolated from the cervix; but no streptococci were obtained on blood culture. Dr. Gibson decided to try "Prontosil". The patient responded well to this treatment. The second patient's blood also showed no streptococci on culture; but hæmolytic streptococci were present in the cervix. This patient was given scarlet fever antitoxin as well as "Prontosil", and she also responded to treatment. Dr. Gibson decided to test "Prontosil" with a bacteriological control. To get good results with "Prontosil" it was necessary to give it early. Dr. Gibson said that he would let the profession know the results of his investigation. He had known of one case in which the blood culture was positive and yet the condition subsided rapidly with antitoxin; in other cases it had been quite valueless. The general results in acute puerperal streptococcal septicæmia were so appalling that Dr. Gibson was hoping to find something that would be of value. He hoped that "Prontosil" would live up to expectations.

Dr. J. C. STOREY thanked the speakers and said that he welcomed the appearance of Professor Ward at the meeting; he only wished that university professors could come more often to these meetings to give members the benefit of their experience. Dr. Storey had been interested too in Dr. Aspinall's paper. He gathered that on the whole Dr. Aspinall condemned meddlesomeness. Dr. Storey agreed with him in this. Yet one still saw in textbooks that early and free incision was the correct treatment in cellulitis. The more one saw of these cases, the less one did. Dr. Storey was persuaded that it was unwise to interfere early. It was wiser to wait for the formation of pus.

Dr. Storey agreed that a nail-brush was a dangerous instrument. The only one he used was a sterilized one before operations. Many infections started from dirty nail-brushes.

He did not agree with Dr. Aspinall concerning early operation in streptococcal empyema. He agreed with Dr. Hipsley. It was wiser to aspirate, repeatedly if necessary, before attempting operation.

Dr. Storey was interested in Professor Ward's condemnation of streptococcal antiserum. He himself had always felt that it was useless. But if the patient had a streptococcal infection, such as erysipelas for example, it took courage not to use it. Dr. Storey asked if Professor Ward thought any serum was of any use in such cases. In regard to treatment, Dr. Storey thought that absolute rest of the affected part might have been stressed more.

Dr. E. F. THOMSON spoke of the seasonal incidence of streptococcal infections. During the three winters he had spent in Sydney he had noticed an increased incidence in this type of infection, especially in the present year. In these months there was a greater incidence than during the rest of the year. Dr. Thomson mentioned that he used only human blood plates for his cultures; but he thought that the hæmolytic streptococci isolated on this type of medium were the same as those which were hæmolytic on horse blood agar.

Dr. Thomson felt that phagedenic ulceration was more common than was imagined and that medical practitioners should be on the look-out for it. The condition was caused by the synergic action of the hæmolytic streptococcus and *Staphylococcus aureus*. He had seen five cases in the past three years. In the first case extensive ulceration of the abdominal wall had followed parametritis. The patient had been ill for two years. After reading Meleney's articles on this subject he had used zinc peroxide paste without effect; intravenous injections of tartar emetic were also tried. Eventually the whole ulcerated area was excised with a diathermy knife, and this was the only thing that had started an improvement in the patient's condition. This patient had now been ill for three years, and Dr. Thomson thought she would get better.

Another patient had a huge ulceration on the neck. The diathermy knife had been used, and Dr. Thomson expressed the opinion that this patient also would get better. In this case he had been unable to find any hæmolytic streptococci, only *Staphylococcus aureus*. Perhaps some cases were due to this organism alone.

Dr. S. SHELDON said that he had no special clinical knowledge of streptococcal infections, but was of the opinion that when people had real septicæmia, such as after abortion, they scarcely ever got better. He doubted if any good was done by treatment.

Professor Ward had spoken of endocarditis. At the morgue they had difficulty in getting organisms in pure culture, because numerous adventitious microorganisms were present; it was seldom, therefore, that they could get any useful information from bacteriological examination. It was peculiar that if patients with septicæmia lived, they nearly always in time had septic endocarditis and secondary infections in the lungs, which usually finished them.

Dr. Sheldon asked Professor Ward whether any serum ever did any good and whether any patients with heavy blood infection ever got better.

Dr. F. S. HANSMAN assured Dr. Sheldon that he had known patients who were very ill, with hæmolytic streptococci in the blood stream, really to get better after the administration of serum; but he was not prepared to say that recovery had been due to the serum. Within twenty-four hours he had seen the temperature come down and the blood culture become sterile. And this happened although, when the blood had first been tested, there were so many organisms that it was necessary to incubate for only twelve hours and then spin the flask to get organisms.

Professor Ward, in reply, said that some patients did recover from streptococcal bacteriæmia, although the chances were against recovery. It would perhaps be possible to get more information as to the patient's condition if a measured amount of blood were taken and the number of organisms present estimated. The method of gauging the time of the first signs of growth in a broth culture of the blood was not so accurate as mixing a known amount of blood with agar and counting the colonies after incubation. It had been shown in both pneumococcal and streptococcal bacteriæmias that there was some correlation between the number of colonies and the prognosis. If

there were over a thousand colonies per cubic centimetre of blood, then the outlook was not hopeful.

Professor Ward said that Dr. Tebbutt held more hopeful views concerning the use of streptococcal antitoxin than he did. No doubt Dr. Tebbutt had had more experience of its use, and he would agree with Dr. Tebbutt in so far that if serum was to be used at all, streptococcal antitoxic serum was to be preferred to the so-called streptococcal anti-bacterial serum. Professor Ward based his view on the fact that animal experiments did not encourage the belief that antitoxin was of value in protecting animals. This was quite different from the results of animal experiments with diphtheria infection; striking effects of the administration of antitoxin could be demonstrated in diphtheria. Professor Ward's other main reason for his views on the value of streptococcal antiserum was the result obtained in London at the Queen Charlotte Lying-In Hospital, where, after a thorough investigation, they did not hold any brief for the use of serum in these diseases. At this hospital the figures appeared to show that the use of serum gave worse results than when no serum was used. Even if the figures were slightly favourable, the chances were that serum therapy was of little avail, for it was known that there was a normal recovery rate if nothing was done. The results of serum therapy in streptococcal infections should be contrasted with those in Type I pneumonia, in which there was no question of the therapeutic value of serum. He felt sure that if serum was of use in streptococcal infections the figures would show it.

Dr. Aspinall, in reply to Dr. Hipsley, said that he had advocated early operation, but not immediate operation; and he admitted that he had been rather trailing his coat. He had been called to operate on patients on whom repeated aspiration had been carried out and who were desperately ill. In reply again to Dr. Hipsley, Dr. Aspinall said that in the cases of adenitis that he had mentioned he had thought of the possibility of scarlet fever, but had been able to get no signs.

Dr. Aspinall agreed that many masks were not efficient; but yet they did a certain amount of good, and at least stopped unnecessary talking in the theatre. In some operating theatres the operation took the form of a happy gathering. Dr. Aspinall thought that everyone in the theatre should be masked. Dr. Worrall had a good way of wearing a mask; he used copper wire instead of tape, so that it could be bent to fit over the nose and round the ears; this prevented the fogging of spectacles.

Dr. E. H. M. STEPHEN said that it was his honourable duty to thank the speakers. Dr. Aspinall's paper had been clear and instructive, as one would expect. Professor Ward had further demonstrated his ability to teach. Dr. Stephen had also enjoyed the comments of those who contributed to the discussion. He agreed that the nail-brush was an enemy of health; in his youth he had thus acquired erysipelas, with much loss of prestige and self-respect. It was quite possible to have a sincere wash with soap in the manner described by Dr. Storey.

A MEETING of the Victorian Branch of the British Medical Association was held at the Queen Victoria Hospital, Melbourne, on September 16, 1936. The meeting took the form of a series of clinical demonstrations by members of the honorary medical staff of the Queen Victoria Hospital. Part of this report appeared in the issue of November 28, 1936.

Still's Disease.

Dr. MONA BLANCH showed a girl, aged nine years, who, in May, 1932, at the age of four years and ten months, had developed a slightly sore throat and croupy cough, followed ten days later by joint pains and fever. Ankles, knees, wrists and elbows became swollen with fluid, and painful, while the temperature rose to 39.5° C. (103° F.), despite large doses of salicylate of soda. After three weeks there was involvement of metacarpo-phalangeal and proximal interphalangeal joints of the hands also. Lymph glands, including the epitrochlear, were involved, and the spleen was palpable on one occasion; but the heart was not affected.

In August, 1932, the temperature had subsided to 37.7° C. (99.8° F.) or under for three weeks. The tonsils were enucleated and an autogenous vaccine of hæmolytic streptococci was prepared from them. The child weighed only 12.5 kilograms (28 pounds) at that time. So far, the treatment carried out had been symptomatic; in addition to the vaccine treatment "Thermogene" had been bandaged firmly on the affected joints and syrup of ferrous iodide and "Radiostoleum" had been given by mouth. On August 13 the first injection of the autogenous vaccine (twenty-five million per cubic centimetre) was given. Massage to the wasted muscles, the joints being avoided, was begun at the same time. Injections of vaccine in increasing doses were given at intervals of five days; when the dose had reached 1.0 cubic centimetre the joints became worse. The dose was then reduced to 0.3 cubic centimetre and immediate improvement occurred. After some weeks it was again increased slowly up to ninety million bacteria. At this time there was still fluid in the large joints and the neck was stiff; but the fingers were normal. In March, 1933, the vaccine was given in the same dose at fortnightly intervals. In April, 1933, there was still fluid in the knees; but otherwise the arms and legs appeared normal and the child was looking well. In September, 1933, the vaccine was discontinued, although there was still a little puffiness of both knees. Dr. Blanch said that the child's progress had been uninterrupted until July, 1934, when, after three weeks' malaise, the left wrist had become painful and swollen. At that time there was a little grating of both knees and a weakness of the intrinsic muscles of the feet; but the child appeared normal in every other respect. The wrist improved in a few days; but, despite plaster night-shoes and exercises, there was still some foot-drop at the transverse articulation. Apart from this and a suggestion of fusiform swelling in the third finger in each hand, the child was still strong and healthy three years after the cessation of vaccine treatment.

Recurrent Erythroderma.

Dr. Blanch also showed a boy, aged five and a half years, who had had three attacks of pink disease. He had had his first attack at the age of fourteen months. After several weeks' illness he had been taken to the Homœopathic Hospital, where liver and "Marmite" had been given. The illness had lasted four months. The second attack began in January, 1935, when the child was four years old. When seen by Dr. Blanch two weeks after the onset, he presented the typical picture of pink disease. He was given dicalcium phosphate, "Bemax" and sedatives. During the next six weeks the child rubbed his head so much with his hands that he became almost bald on the vertex. He apparently obtained relief for his hands by this action, as he also liked his mother to stroke them. Pains behind the knees were troublesome. By the middle of February there was a slight improvement. The progress towards recovery was interrupted by the occurrence of boils. He was well again in May. In July, 1935, he suffered from coryza with mild conjunctivitis; after a fortnight his hands and feet became itchy and photophobia returned. Sleeplessness and anorexia were apparent, and his mother stated that his condition was exactly as it had been at the onset of the previous illness. On examination, apart from the symptoms mentioned above, there was pinkness of the hands, but no swelling or rash. The patient was given grated liver and the juice of six oranges daily. Dr. Blanch said that he improved visibly in a fortnight, but complained of pains behind the knees; in a month he was bright and eating well, but still complaining of a few pains, and in six weeks he had quite recovered and had gained a little weight; there was no further trouble. Dr. Blanch said that there were five older boys in the family and they were all well cared for, and as none of them had been ill she could find no explanation of these attacks.

Toxæmias of Pregnancy.

Dr. ISABEL IRELAND showed a patient illustrating the probable association between habitual abortion with toxæmia of pregnancy and endocrine dysfunction. Dr. Ireland also showed a patient who had suffered from

preeclamptic toxæmia with death of the fœtus at thirty weeks, in her first pregnancy, and within twelve months had been delivered of a normal baby after a normal pregnancy.

Dr. Ireland also showed a patient with recurrent toxæmia or "occult nephritis".

Dr. Ireland's next patient had suffered from hypertension when fourteen weeks pregnant. Signs of preeclamptic toxæmia supervened slowly. Tubal induction of labour was practised; but mild intrapartum eclampsia developed. Hypertension was still apparent twelve months later.

Dr. Ireland showed another patient who had had a ureteric and a renal stone removed during early pregnancy; the renal function at that stage had been impaired, but had partially recovered later. Severe eclampsia of sudden onset appeared at twenty-eight weeks, and a macerated fœtus was delivered spontaneously. The renal function recovered in the early puerperium. Five years later the patient had mild hypertension and slight cardiac hypertrophy.

Another patient gave a history of toxæmic pregnancy, resulting in the delivery of a full-term macerated fœtus. The patient in her second pregnancy, at twenty-eight weeks, became severely eclamptic; spontaneous abortion occurred. The renal function was still poor two weeks later. Three months after delivery the patient's general health improved; but she continued to show nephritic signs and symptoms.

The Prevention of Puerperal Sepsis.

Dr. WINIFRED KENNAN demonstrated methods directed towards the prevention of puerperal sepsis. These were first outlined in the form of a chart, suggesting possible barriers to infection. On this chart it was shown from reports published by the British Ministry of Health in 1928 and 1930 that, of 4,655 deaths directly attributable to child-bearing, 1,727 were due to puerperal sepsis, and 46% of these followed normal delivery, so that infection following normal labour caused 18% of all the deaths investigated. Dr. Kennan said that recent bacteriological investigations had made it clear that 85% of infections following normal labour were caused by hæmolytic streptococci. It had been shown that in Victoria deaths of mothers from puerperal conditions (excluding criminal abortion), to every ten thousand children born alive, numbered 47.79. The first barrier against infection was: (a) careful supervision of the diet during pregnancy, to see that it contained ample supplies of vitamins A and D, milk, eggs, green vegetables, carrots and butter; (b) antenatal detection of septic foci, and detection of streptococci carriers during the last two weeks of pregnancy; and (c) the detection of carriers of pathogenic organisms in septic foci or apparently healthy throats of members of the nursing and medical staff. The second barrier comprised: (a) care of attendants' hands, wearing of gloves, and recognition of the danger of handkerchiefs; (b) avoidance of unnecessary interference and undue exposure; (c) careful regular preparation of the patient with regard to the hands as well as the vulva, by washing with an antiseptic, such as "Dettol"; (d) studied nose-breathing and avoidance of talking on the part of the attendant while bending over the vulva during labour and early in the puerperium, together with the restriction of the number of attendants on any one patient and the segregation of midwifery nurses; (e) masking of attendants in the labour ward, together with detailed instruction in the proper use of masks and the technique of disposal of them after use.

The detailed preparation of the patient at the Queen Victoria Hospital during the present year, in which these general principles had been put into practice, was described by Dr. Kennan by means of a chart. Diagrams showing the correct use of masks were also displayed, together with samples of the types of mask in use and of the lotion and cream used in the preparation of the patient. Dr. Kennan also showed the morbidity chart of the hospital for the previous twelve months. She expressed the opinion that the present methods would have to be in use for a longer period before definite conclusions as to their efficacy could be drawn.

Investigation of Hæmolytic Streptococci.

Dr. LUCY BRYCE, in conjunction with Dr. Kennan's demonstration, presented the results so far obtained in an investigation into the incidence of hæmolytic streptococci in the nose and throat of members of the medical and nursing staffs of the Queen Victoria and Jessie MacPherson Hospitals. This investigation was undertaken following the occurrence, at the end of December, 1935, of three cases of puerperal pyrexia, all of which were clinically septicæmic and two of which ended fatally. In one fatal case hæmolytic streptococci had been isolated from the blood stream. Possible sources of infection and means of transference of infection from case to case were discussed. Cultures had been made from the nose and throat of thirty-six medical practitioners and nurses who had been in contact with these patients. A high carrier rate (30.5%) of hæmolytic streptococci of human pathogenic type, as judged by biochemical methods, was found.

During May and June and August and September, 1936, similar examinations were made of the general medical and nursing staffs of the Queen Victoria and Jessie MacPherson Hospitals, particularly of trainees about to enter midwifery wards. In the May-June series of 68 persons, 18%, and in the August-September series of 87 persons, 38% were found to harbour hæmolytic streptococci. The work of classification by means of biochemical and precipitin tests of the strains isolated from these two series was in progress.

In some cases hæmolytic streptococci were present for a short time only; in most of these their presence seemed to be associated with the prevalence of common colds or other mild acute infections of the upper respiratory tract, or followed contact with known streptococcal infections. In others, repeated cultures showed the constant presence of hæmolytic streptococci over longer periods, and in these, treatment of chronically infected tonsils or nasal sinuses was being undertaken or considered.

Dr. Bryce showed a series of blood-agar plates of cultures from individuals in the above series, and of streptococci from the blood stream and uterus in infected cases.

(To be continued.)

Correspondence.

MEDICAL EDUCATION.

SIR: On page 705 of your issue of November 21, 1936, in the interesting address by Professor Wilkinson, there are some remarks on the qualifications required for matriculation for medical students.

Senior standard German is apparently favoured as an essential qualification on the ground that such study makes it possible for medical students "to gain access to the greatest volume of medical literature written outside their tongue".

While admitting that a working knowledge of German and French is a tremendous asset to the medical man who intends to become a research worker or teacher, I am more than doubtful as to the advisability of putting this admittedly difficult subject as an encumbrance to the approach to a profession in which probably 90% have no intention of becoming other than expert practitioners in the treatment of medical or surgical cases.

Apart from the fact that "the greatest volume" of medical literature may become an ill-digested encumbrance, would it not be far better to make a general knowledge of biology (not zoology and botany as separate subjects) the essential factor for matriculation qualification.

I have repeatedly proved that the elements of biology can be easily taught to school boys from eleven or twelve years old on, and is seized on avidly as an interesting subject, and I am equally sure that such a general knowledge is a matter of the greatest importance to the mental training of the medical man.

Not merely is biological knowledge (of course associated with an elementary understanding of chemistry and physics) the corner-stone to any rational understanding of the body in health or disease, but it undoubtedly opens wide doors of understanding into the perplexities of mental, psychic and neurotic conditions, so often based on the frustration or otherwise of instincts, urges and reflex action inherent in the animal make-up of *Homo sapiens*.

Let me interpolate I am not pleading for the detailed instruction into the mouth parts of a cockroach nor the memorization of a series of special names of a thousand particular parts or organs, but for the clear exposition to the school boy or girl of the known facts of life stuff and cell communities that underlie the working of the living machine and those influences interfering with normal action and reaction in such machines.

Incidentally I am of those who, rather than adding to the length of an already over-long medical curriculum, would shorten it (for general practitioners), firstly by making elementary chemistry, physics and biology subjects of the school curriculum, by curtailing the activities of teachers in the early years who appear to regard each student as a potential specialist in physics, botany, zoology or physiology, to be rammed to bursting point in their own special subject.

With a preliminary school training in the elements the undergraduate in medicine would instead be given short courses of each subject in these early years as applied to medicine, and much more time would be available for the practical instruction in the art and science of the treatment of disease.

There would be, say after five years, a final examination as to his competency as a general practitioner.

If he or she wished to specialize there would be after this a special course planned to that end.

Yours, etc.,

BURTON BRADLEY.

"Wyoming",
Macquarie Street,
Sydney,
November 23, 1936.

THE LIBRARY OF THE SCHOOL OF PUBLIC HEALTH AND TROPICAL MEDICINE, SYDNEY.

SIR: The library of the School of Public Health and Tropical Medicine, University of Sydney, has as one of its objectives a complete reference library in public health and in tropical medicine in the Australasian region (Austral-Pacific zone). It is anxious to complete certain sets of medical journals published in Australia.

The Director would be glad to hear from any practitioner who may possess any of the copies noted in the following list:

- Australian Medical Journal*, New South Wales, 1846-1847.
- Australian Medical Journal*, Victoria (afterwards *Inter-colonial Medical Journal*, afterwards *Australian Medical Journal*), 1856-1861 and 1911-1914 (New Series).
- Medical Record of Australia*, Victoria (afterwards continued as *Melbourne Medical Record*, Victoria), 1861-1863, 1875-1877.
- Medical and Surgical Review*, Australasian, Victoria, 1863-1864, 1873-1875.
- Australian Medical Gazette*, Victoria, 1869-1871.
- New South Wales Medical Gazette*, New South Wales, 1870-1875.
- Australian Practitioner*, New South Wales, 1877-1878.
- Journal of the Sanitary Inspectors' Association of Western Australia*, 1908.

Yours, etc.,

HARVEY SUTTON,
Director.

School of Public Health and Tropical Medicine,
Sydney,
November 20, 1936.

Obituary.

GEORGE JAMES HODGSON.

We regret to announce the death of Dr. George James Hodgson, which occurred on November 18, 1936, at St. Kilda, Victoria.

Corrigendum.

In the issue of November 14, 1936, an account is given of a demonstration of Lange's colloidal gold tests at the clinical meeting of the Victorian Branch of the British Medical Association held at the Alfred Hospital. Dr. W. J. Penfold, Director of the Baker Institute, writes that our report was misleading in that he and Miss Phillips are credited with this work. The work was entirely that of Mr. James Sutherland, a member of the staff of the Baker Institute. Owing to illness, Mr. Sutherland was unable at the meeting to carry out the demonstration with Dr. Penfold, as had been arranged.

Books Received.

ADDENDUM 1936 TO THE BRITISH PHARMACOPŒIA 1932, published under the direction of the General Council of Medical Education and Registration of the United Kingdom: 1936. London: Constable and Company Limited (for the General Medical Council). Demy 8vo, pp. 152. Price: 5s. net.

Diary for the Month.

- DEC. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 DEC. 8.—New South Wales Branch, B.M.A.: Ethics Committee.
 DEC. 8.—Tasmanian Branch, B.M.A.: Branch.
 DEC. 10.—New South Wales Branch, B.M.A.: Branch.
 DEC. 10.—Victorian Branch, B.M.A.: Council.
 DEC. 11.—Queensland Branch, B.M.A.: Annual Meeting.
 DEC. 15.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 DEC. 15.—Tasmanian Branch, B.M.A.: Council.
 DEC. 18.—Queensland Branch, B.M.A.: Council.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xxii-xxiv.

- FREMANTLE HOSPITAL, FREMANTLE, WESTERN AUSTRALIA: Resident Junior Medical Officer.
 LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officer.
 LORD HOWE ISLAND BOARD OF CONTROL: Medical Officers.
 MUKINBUDIN ROAD, HEALTH AND VERMIN BOARD, MUKINBUDIN, WESTERN AUSTRALIA: Medical Officer.
 ROYAL NORTH SHORE HOSPITAL OF SYDNEY, NEW SOUTH WALES: Honorary Director, Department of Radium Therapy.
 SAINT VINCENT'S HOSPITAL, MELBOURNE, VICTORIA: Junior Resident Medical Officers.
 SCHOOL OF PUBLIC HEALTH AND TROPICAL MEDICINE, UNIVERSITY OF SYDNEY, NEW SOUTH WALES: Diploma in Tropical Medicine, Diploma in Public Health.
 SYDNEY HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Physician.
 THE BRISBANE AND SOUTH COAST HOSPITALS BOARD, QUEENSLAND: Honorary Officers.
 THE METHODIST CHURCH OF AUSTRALASIA, SYDNEY, NEW SOUTH WALES: Medical Missionaries.
 THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY: Resident Medical Officers.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.